Objective 1: To compare the effect of different age groups (20-30,31-40,41-50,51-60) on seminal parameters (sperm concentration, volume, total motility, and morphology)

Distribution of Age Groups

Table 1: Percentage analysis of age

Age groups	Percentage
20-30	8.96%
31-40	57.13%
41-50	30.26%
51-60	3.65%
Total	100.00%

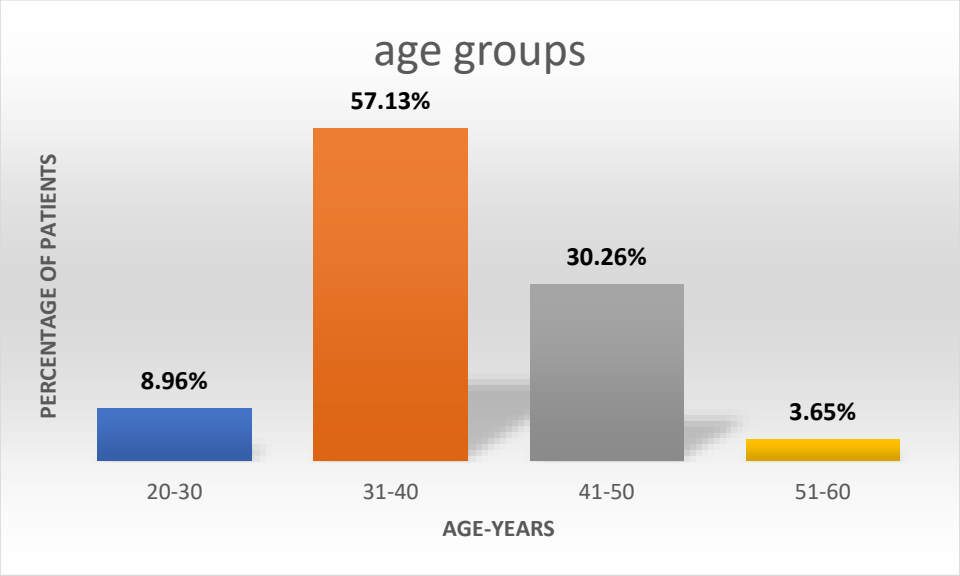
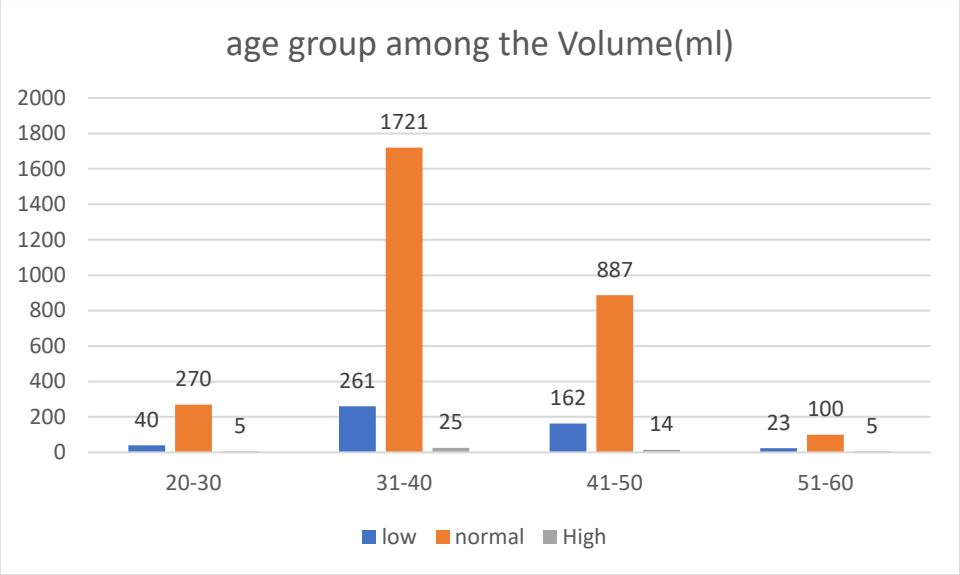
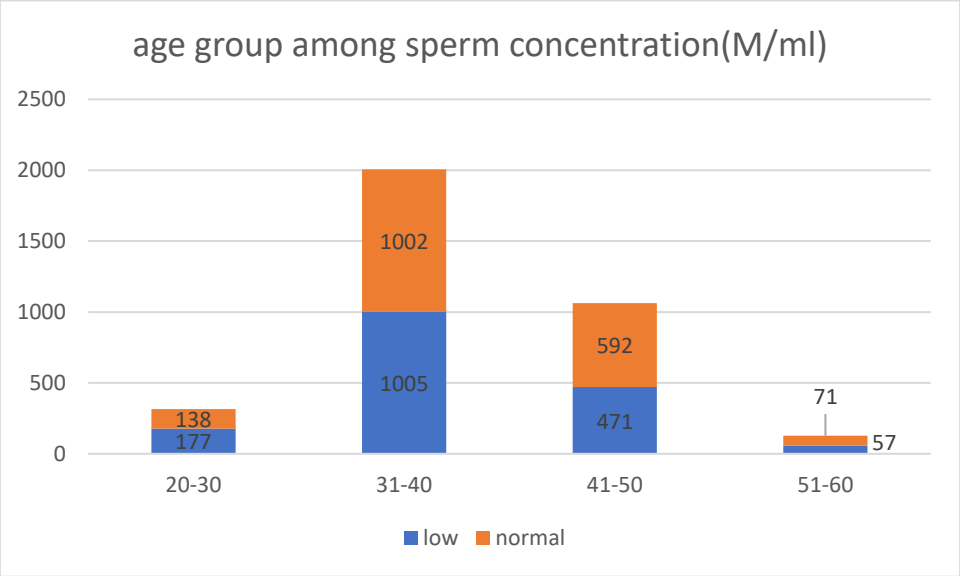


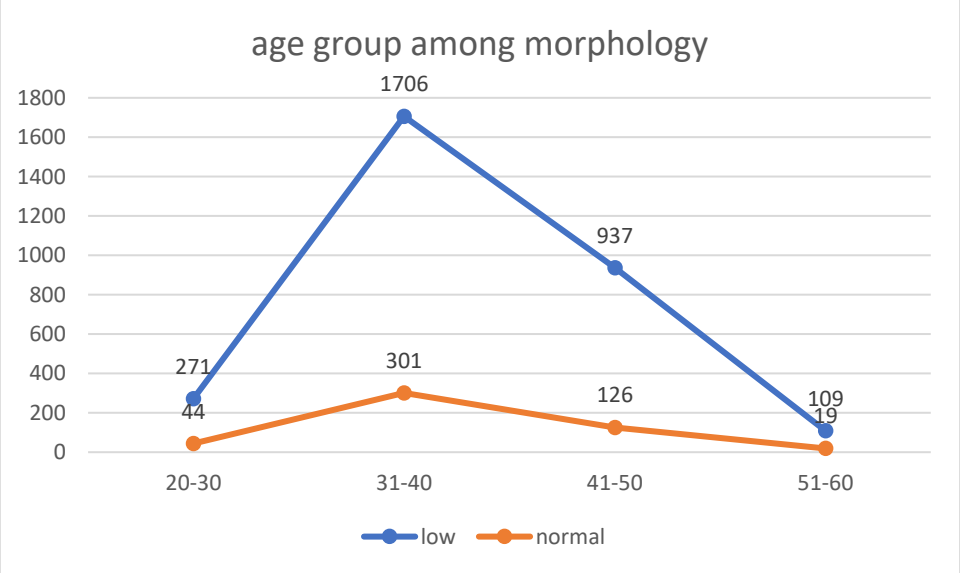
Figure 1: Age distribution of the patients expressed as a percentage

Interpretation:

More than half of the patients 57.13% were in the age group 31-40 years. Around 30.26% were in the age group 41-50 years and 8.96% were in the age group 20-30 years. The rest of patients 3.65% were in the age group 51-60 years.


age group among the Volume(ml)
2000
1800
1600
1400
1200
1000
800
600
400
200
0
40
270
5
261
1721
25
162
887
14
23
100
5
20-30
31-40
41-50
51-60
low
normal
High


age group among sperm concentration(M/ml)
2500
2000
1500
1000
500
0
138
177
1002
1005
592
471
71
57
20-30
31-40
41-50
51-60
low
normal


age group among morphology
1800
1600
1400
1200
1000
800
600
400
200
0
271
44
1706
301
937
126
109
19
20-30
31-40
41-50
51-60
low
normal

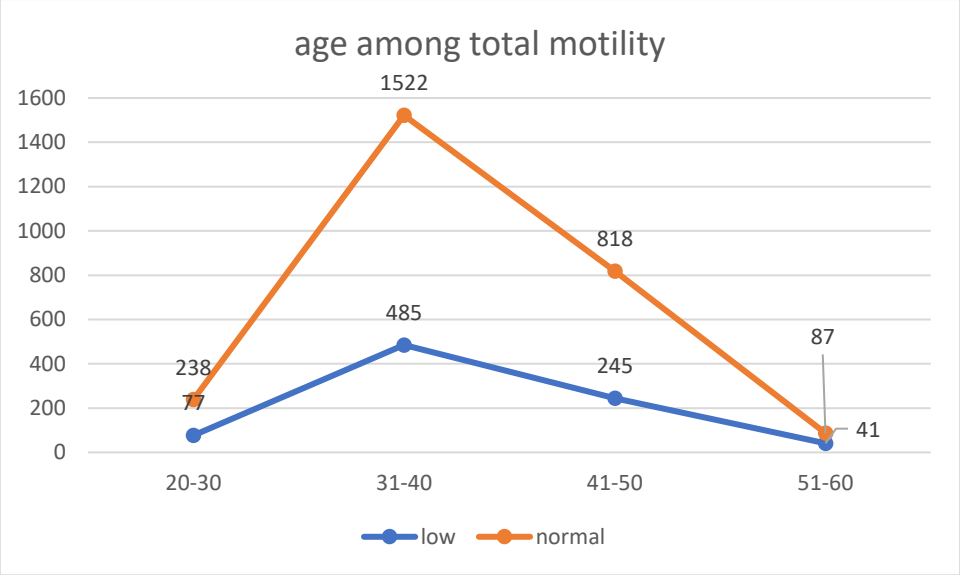
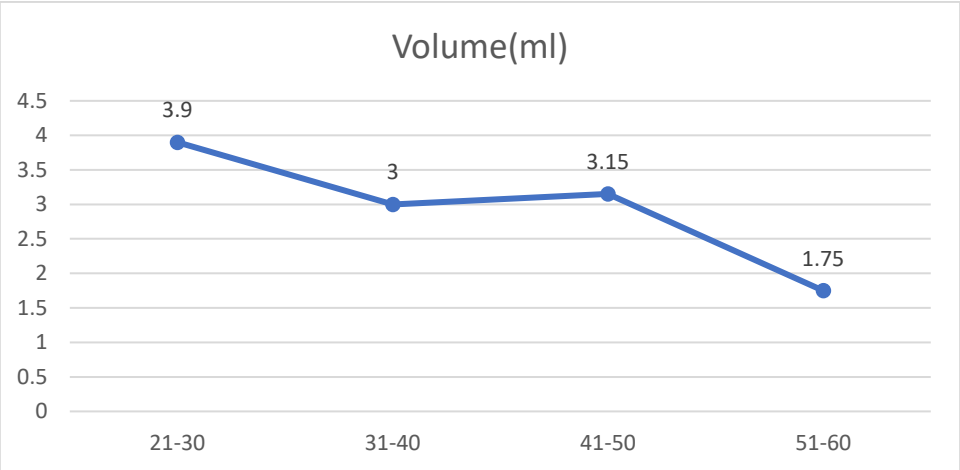


Table Age and semen parameters in the study groups

Variables	21-30	31-40	41-50	51-60	P-value
Volume(ml)	3.9	3	3.15	1.75	0.001
Sperm concentration(M/ml)	10	25	13	13	0.001
Morphology%	1.5	3	1.5	1	0.657
Total motility%	30	52.5	35	50	0.309

All data expressed as median. P-values were determined using Kruskal-Wallis.

The table demonstrates the statistically significant difference in median volume and sperm concentration among the age groups (p=0.001). The median volume for each age group were as follows: 3.9ml for the 21-30 years group, 3ml for the 31-40 years group, 3.15ml for the 41-50 years group, 1.75ml for the 51-60 years group and the median sperm concentration for each age group were as follows: 10M/ml for the 21-30 years group, 25M/ml for the 31-40 years group, 13M/ml for the 41-50 years group, 13M/ml for the 51-60 years group. However, no significant differences were observed in the morphology and Total motility among the different age groups.



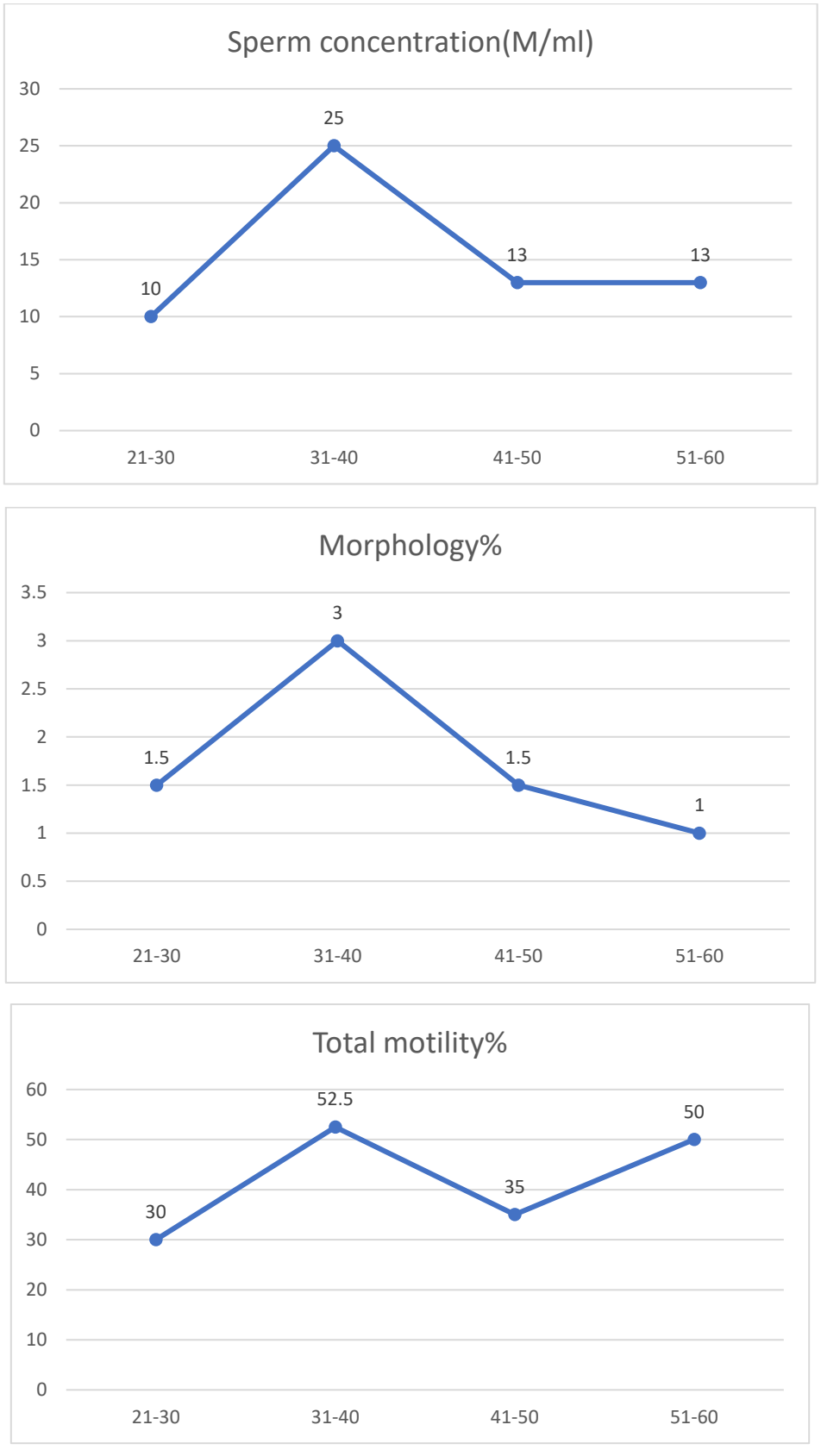


Figure. Seminal parameter values among groups (age range:21-30, n=315, age range:31-40, n=2007, age range:41-50, n=1063, age range:51-60, n=128)

Table

Parameter	Correlation Coefficient[a]	p-value[a]
Semen Volume	-0.059	0.000
Sperm Concentration	0.063	0.000
Total Motility	-0.005	0.786
Normal Morphology	-0.018	0.299

Correlation of different sperm parameters with age

[a]Analyzed by Spearman correlation analysis

Table indicating a statistically significant positive correlation between age and sperm concentration (r=0.06,p=0.00)

Table: Comparison of sperm quality in different age (n=3513)

Age group	Participant (n)	Volume (ml), mean±s.d.	Sperm concentration, mean±s.d.	Morphology % mean±s.d	Total motility% mean±s.d	Progressive motility% mean±s.d	Non-progressive% mean±s.d
21-30	315	2.36±1.05	14.54±13.20	1.72±1.26	42.25±21.60	38.14±23.60	11.90±7.76
31-40	2007	2.38±1.11	16.68±14.33	1.73±1.26	42.74±21.36	37.76±23.20	11.61±7.53
41-50	1063	2.27±1.05	17.64±14.12	1.66±1.17	43.47±20.75	38.39±22.99	12.06±7.59
51-60	128	2.21±1.30	18.09±15.54	1.64±1.25	40.47±20.91	32.91±20.37	11.14±7.07
F-distribution		5.35	22.78	11.94	0.02	3.23	2.76
p-value		0.021	0.000	0.001	0.876	0.072	0.097

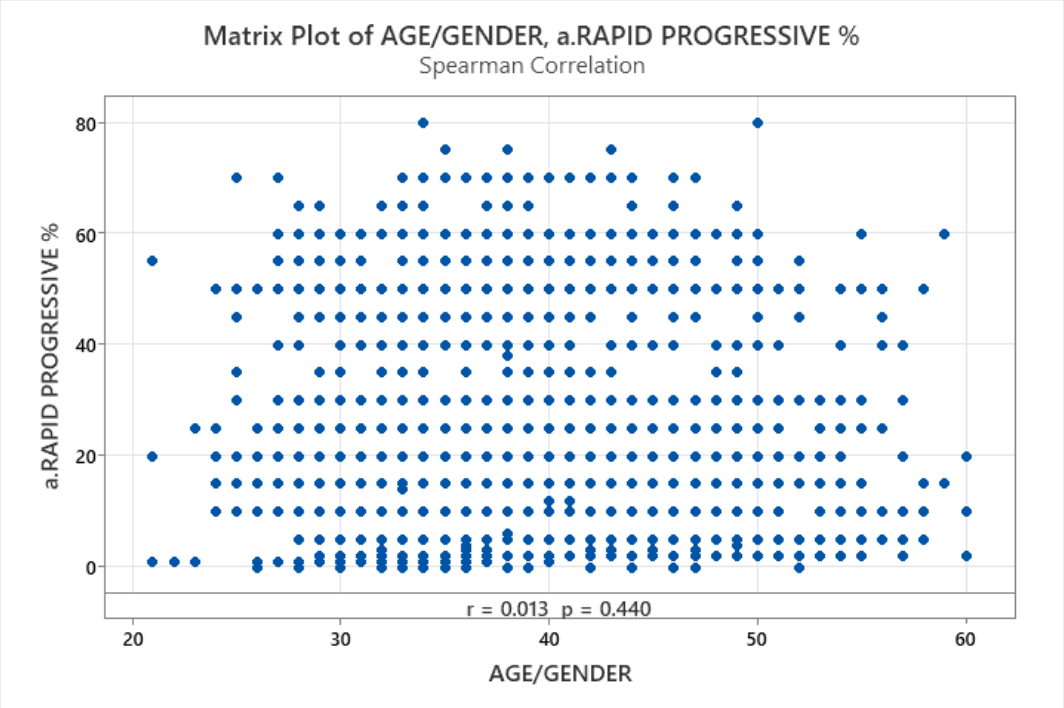
There were statistical differences in semen volume, sperm concentration and morphology among the groups (all $p<0.05$). There were no statistically significant differences in total motility, progressive motility and non-Progressive motility among the groups (all $p>0.05$).

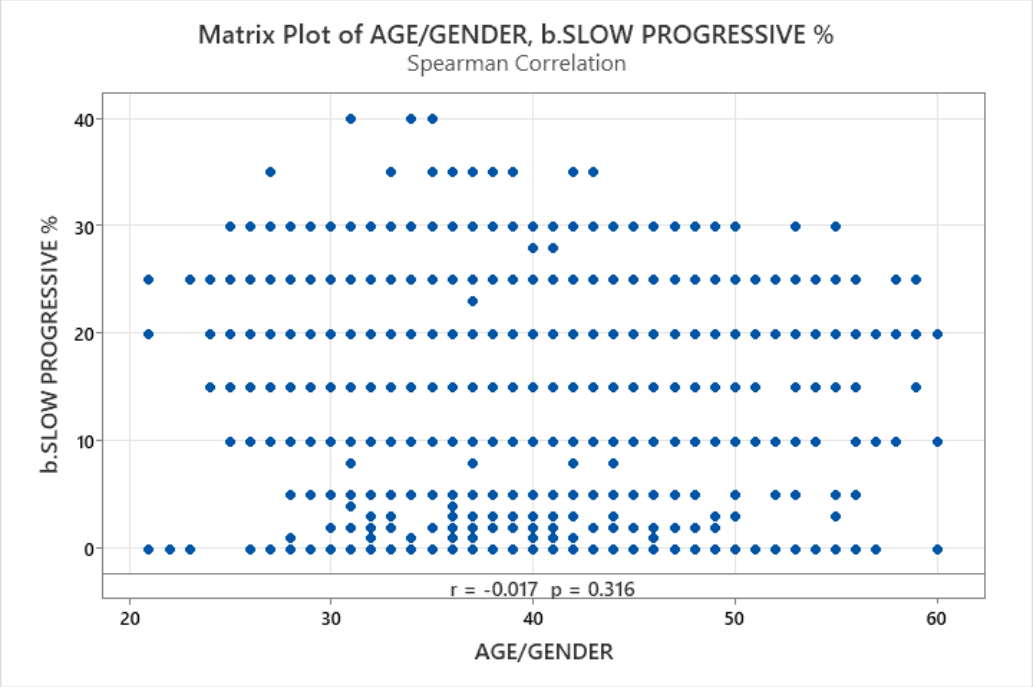
Objective 2 : To evaluate the impact of age on progressive motility (rapid progressive and slow progressive).

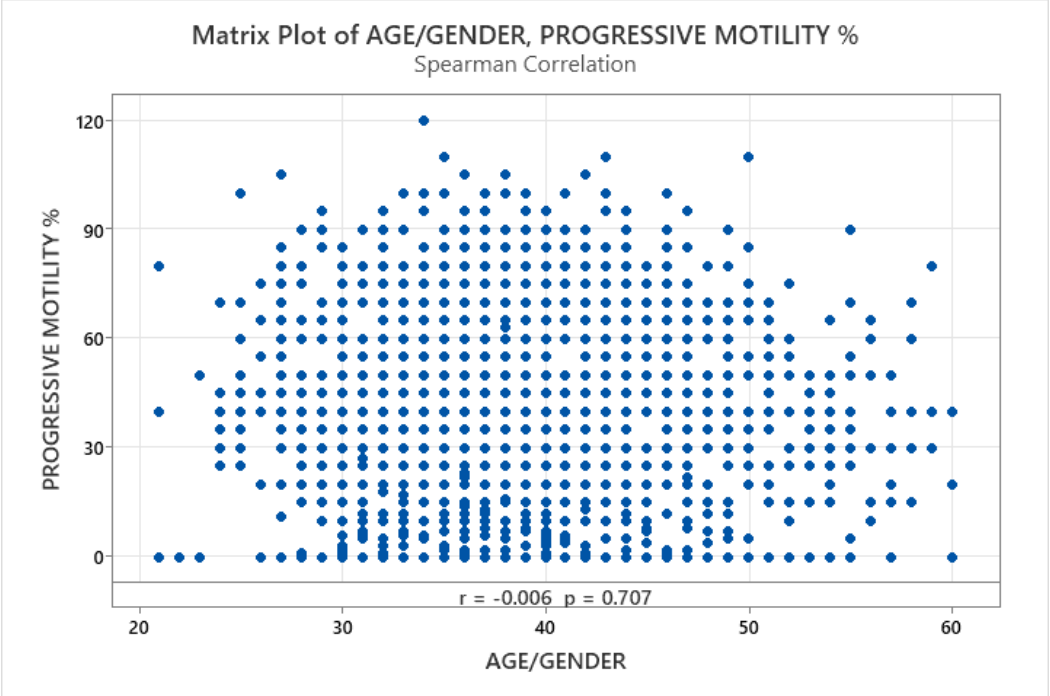
Table: Evaluate the impact of age on progressive motility.

Variables	Rapid progressive% mean±s.d.	Slow progressive% mean±s.d.	Progressive motility
21-30	22.18±17.82	16.12±9.40	38.14±23.60
31-40	21.44±17.20	16.51±9.33	37.76±23.20
41-50	22.04±17.36	16.58±9.02	38.39±22.99
51-60	18.26±15.27	14.59±8.34	32.91±20.37
correlation	0.013	-0.017	-0.006
p-value	**0.440**	**0.316**	**0.707**

There was no statistically significant difference in rapid progressive and slow progressive between the age groups.




Matrix Plot of AGE/GENDER, b.SLOW PROGRESSIVE %
Spearman Correlation
b.SLOW PROGRESSIVE %
AGE/GENDER
r = -0.017 p = 0.316
0
10
20
30
40
20
30
40
50
60


Matrix Plot of AGE/GENDER, PROGRESSIVE MOTILITY %
Spearman Correlation
PROGRESSIVE MOTILITY %
AGE/GENDER
r = -0.006 p = 0.707
0
30
60
90
120
20
30
40
50
60

Objective 3 : To determine the association between the different age groups / Total sperm count(M/Ejaculation) with the male factors.

(N=3513)

Table

Age groups	21-30	31-40	41-50	51-60
Azoospermia	15	72	41	9
Oligozoospermia	4	17	11	3
OligoTeratozoospermia	14	283	127	2
Astheno Teratozoospermia	12	143	116	30
Asthenozoospermia	1	9	6	4
Teratozoospermia	88	595	357	27
Severe oligoasthenoteratozoospermia (SOAT)	67	379	150	14
Oligoasthenoteratozoospermia (OAT)	73	177	138	28
Normozoospermia	41	234	112	11
Globozoospermia	0	3	1	0