Total patients = 21

Female = 10

Male = 10

Male/ female at birth – 1

Basic Statistics:

- The study successfully included 21 patients (10 females, 10 males, 1 male/female at birth)
- Age range was 15-25 years (mean 19.95 ± 2.44 years)
- Time from transplant ranged from 1-16 years (mean 7.71 ± 4.61 years)

	AGE	BMI *	FAT (%)	HgA1c	LDL	HDL \
count	21.000000	21.000000	21.000000	19.000000	17.000000	17.000000
mean	19.952381	25.433333	26.842857	5.205263	87.117647	44.941176
std	2.438774	4.548443	7.320080	0.393663	30.783279	12.208965
min	15.000000	19.400000	11.800000	4.300000	49.000000	27.000000
25%	18.000000	22.000000	21.000000	5.000000	63.000000	33.000000
50%	20.000000	24.200000	27.000000	5.300000	71.000000	47.000000
75%	21.000000	27.600000	31.000000	5.350000	113.000000	54.000000
max	25.000000	38.000000	40.100000	5.900000	143.000000	64.000000

	Triglycerides	QOL	PHQ9	GAD7
count	17.000000	9.000000	13.000000	13.000000
mean	153.705882	73.686667	6.769231	8.384615
std	73.124692	14.813312	5.262348	5.575818
min	46.000000	58.700000	0.000000	0.000000
25%	99.000000	60.870000	3.000000	3.000000
50%	143.000000	67.920000	6.000000	9.000000
75%	175.000000	89.130000	9.000000	12.000000
max	341.000000	96.740000	18.000000	18.000000

Obesity Classifications Comparison:

- BMI method showed 38.1% abnormal weight (23.8% overweight, 14.3% obese)
- Body fat % method showed 28.6% abnormal weight (23.8% overweight, 4.8% obese)
- The difference was most notable in obesity classification (14.3% vs 4.8%)

BMI Classifications:

BMI_   Category

Normal   13

Overweight   5

Obese   3

- Overweight/Obese by BMI: 38.1%

Body Fat Classifications:

Normal   15

Overweight   6

- Overweight/Obese by Fat%: 28.6%

Gender Specific statistics:

- Males showed higher rates of overweight/obesity than females in both methods
- BMI method: Males 45.5% vs Females 30.0%
- Fat% method: Males 36.4% vs Females 20.0%

Female Statistics (n=10):

Overweight/Obese by BMI: 30.0%

Overweight/Obese by Fat%: 20.0%

Male Statistics (n=10):

Overweight/Obese by BMI: 40.0%

Overweight/Obese by Fat%: 30.0%

Clinical Metrics:

- High prevalence of hypertension (52.4% on BP medications)
- Mental health metrics showed gender differences:
- Females had higher PHQ9 scores (8.00 ± 4.69 vs 3.67 ± 2.42)
- Females had higher GAD7 scores (9.00 ± 4.74 vs 7.43 ± 6.60)
- Quality of life scores averaged 73.69 ± 14.81

Age (years): 19.95 ± 2.44

Years from transplant: 7.71 ± 4.61

HgbA1c: 5.21 ± 0.39

LDL: 87.12 ± 30.78

HDL: 44.94 ± 12.21

QOL score: 73.69 ± 14.81

Depression (PHQ9): 6.77 ± 5.26
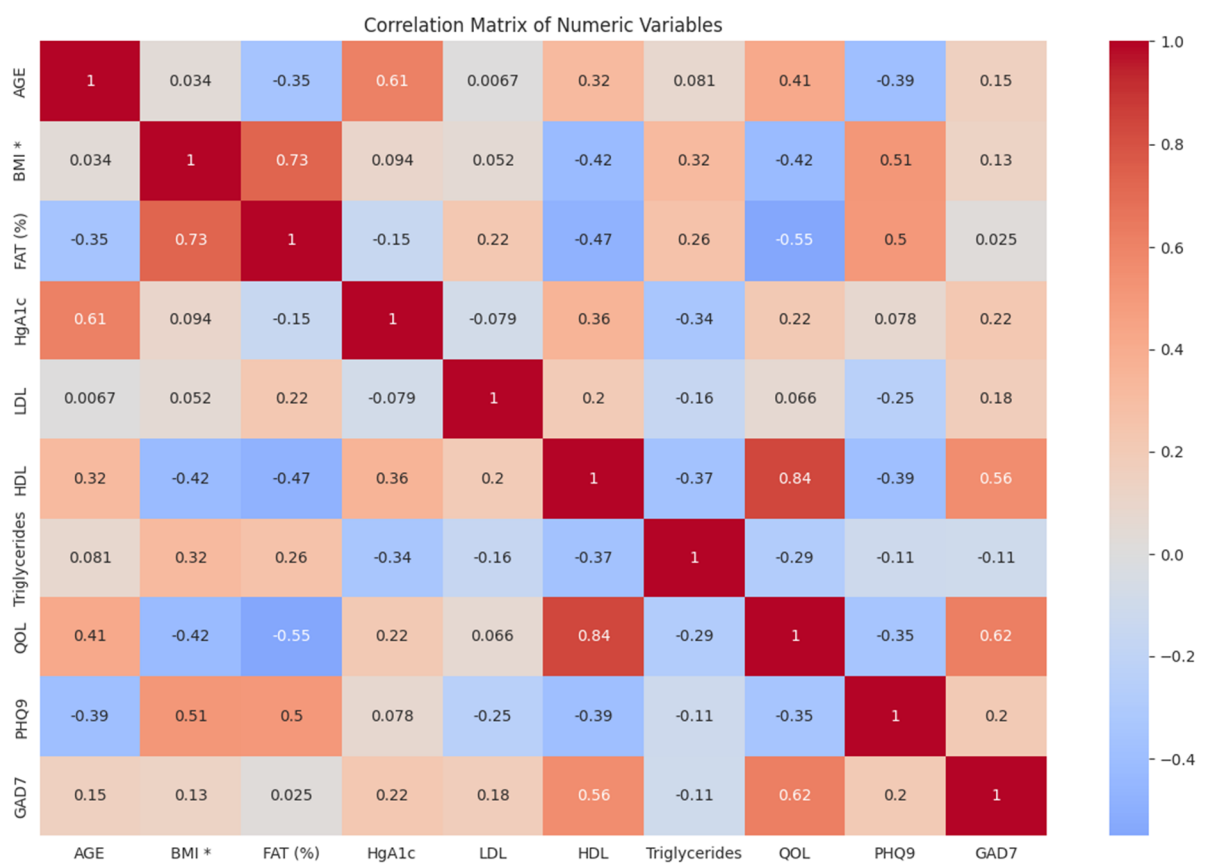
Anxiety (GAD7): 8.38 ± 5.58

Hypertension (on BP meds): 52.4%

Mental Health Analysis:

Mental Health metrics by Gender –

GENDER	PHQ9		GAD7		QOL	
	mean	std	mean	std	mean	std
Female	8.00	4.69	9.00	4.74	7 7.17	15.90
Male	3.67	2.42	7.43	6.60	72.88	15.12
Male (Female at birth)	18.00	NaN	12.00	NaN	58.70	NaN

Correlation Heatmap:

Correlation Matrix of Numeric Variables

Analysis of correlation table –

- Strong positive correlation (0.73) between BMI and Fat%
- Notable negative correlation (-0.55) between Fat% and Quality of Life (QOL)
- HgA1c shows moderate positive correlation (0.61) with Age
- Strong positive correlation (0.84) between HDL and QOL
- Depression (PHQ9) and Anxiety (GAD7) show positive correlation (0.2), but not as strong as might be expected
- BMI shows moderate negative correlation (-0.42) with HDL
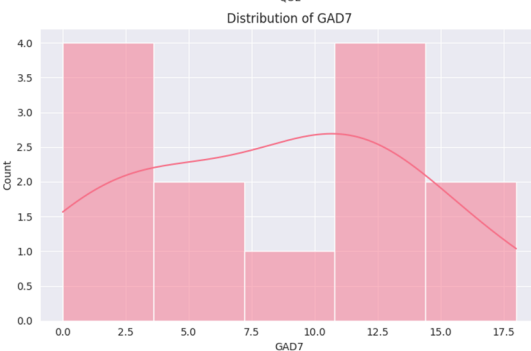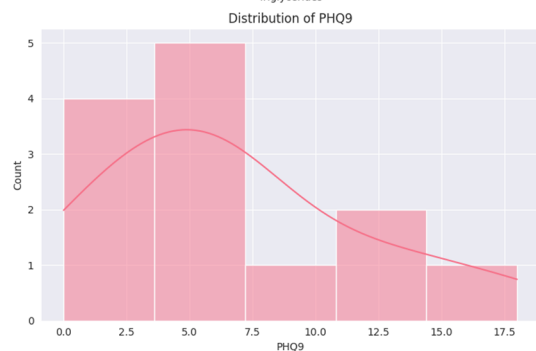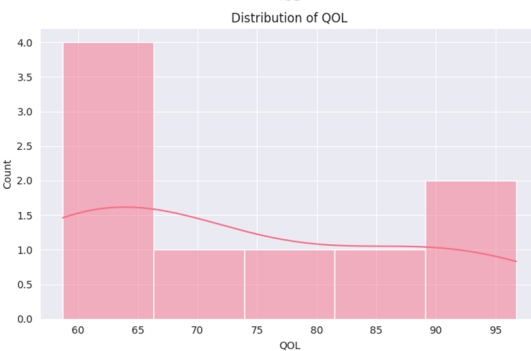
Distribution plots:

Analysis of distribution –
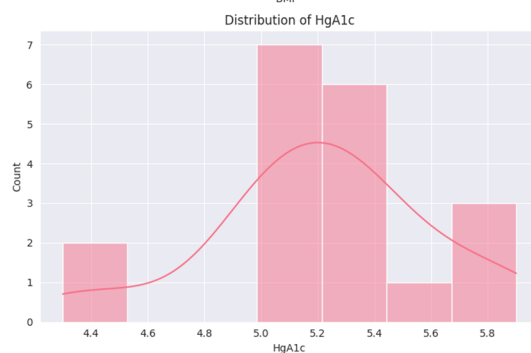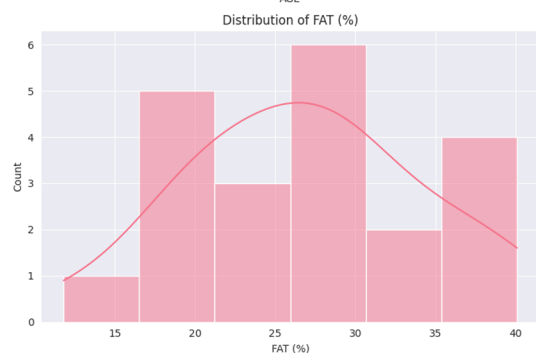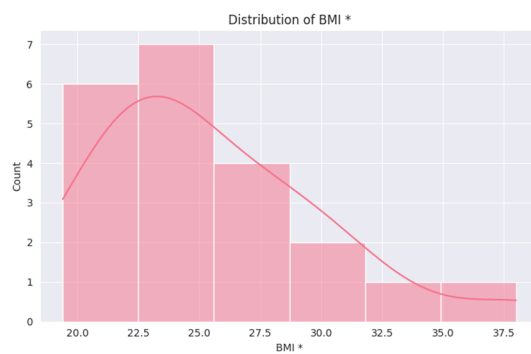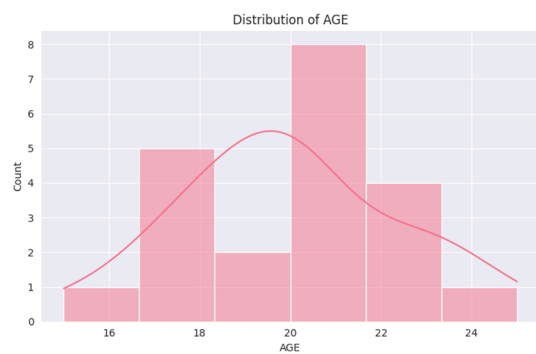
a. **Age distribution**
   - Bell-shaped distribution centered around 20 years
   - Range from 15 to 25 years
   - Most patients clustered between 18-22 years
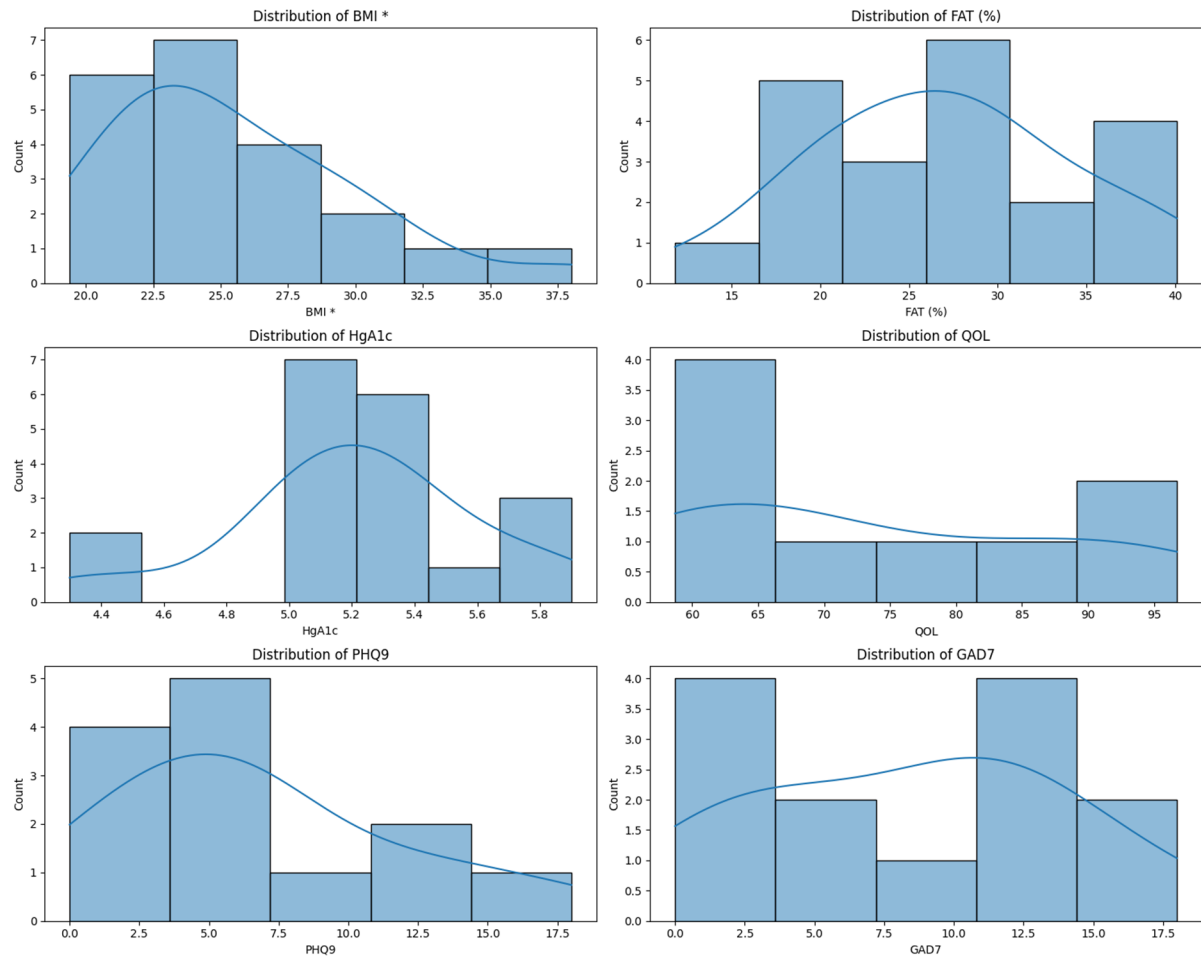b. **BMI distribution**
   - Right-skewed distribution
   - Most values between 22.5-27.5
   - Few outliers above 35
c. **Fat% distribution**
   - Bimodal distribution
   - First peak around 20-25%
   - Second peak around 30-35%
   - Wide spread from 15% to 40%

Distribution of AGE

Distribution of BMI *

Distribution of FAT (%)

Distribution of HgA1c

Distribution of LDL

Distribution of HDL

Distribution of Triglycerides

Distribution of QOL

Distribution of PHQ9

Distribution of GAD7

Distribution of BMI *

Distribution of FAT (%)

Distribution of HgA1c

Distribution of QOL

Distribution of PHQ9

Distribution of GAD7
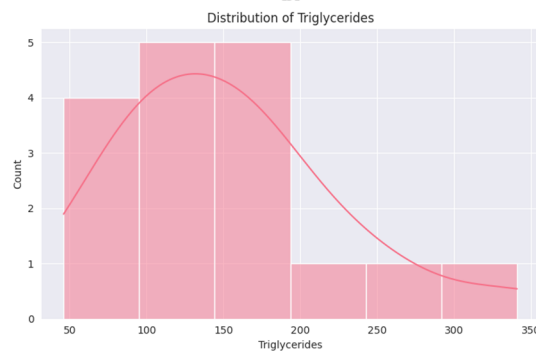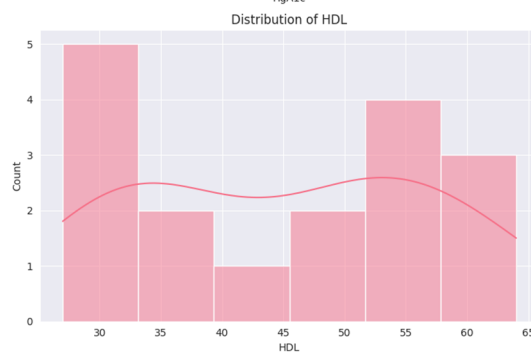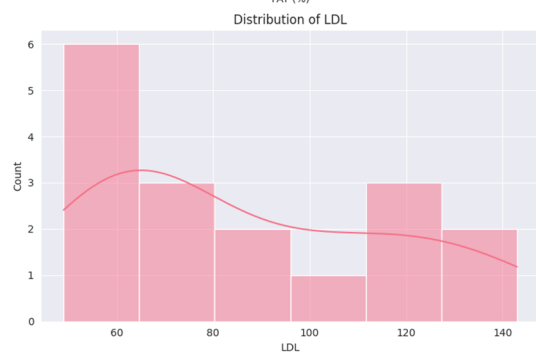
Gender Comparison:

    a. BMI by Gender:
- Males show slightly higher median BMI
- Females show less variability in BMI
- One male outlier with high BMI

    b. Fat% by Gender:
- Females show higher median body fat percentage
- Males show wider distribution
- Clear gender difference in fat distribution patterns

    c. PHQ9 (Depression) by Gender:
- Females show higher median depression scores
- Females show greater variability
- Males cluster in lower range

    d. GAD7 (Anxiety) by Gender:
- Similar pattern to PHQ9
- Females show higher median anxiety scores
- More variability in female scores
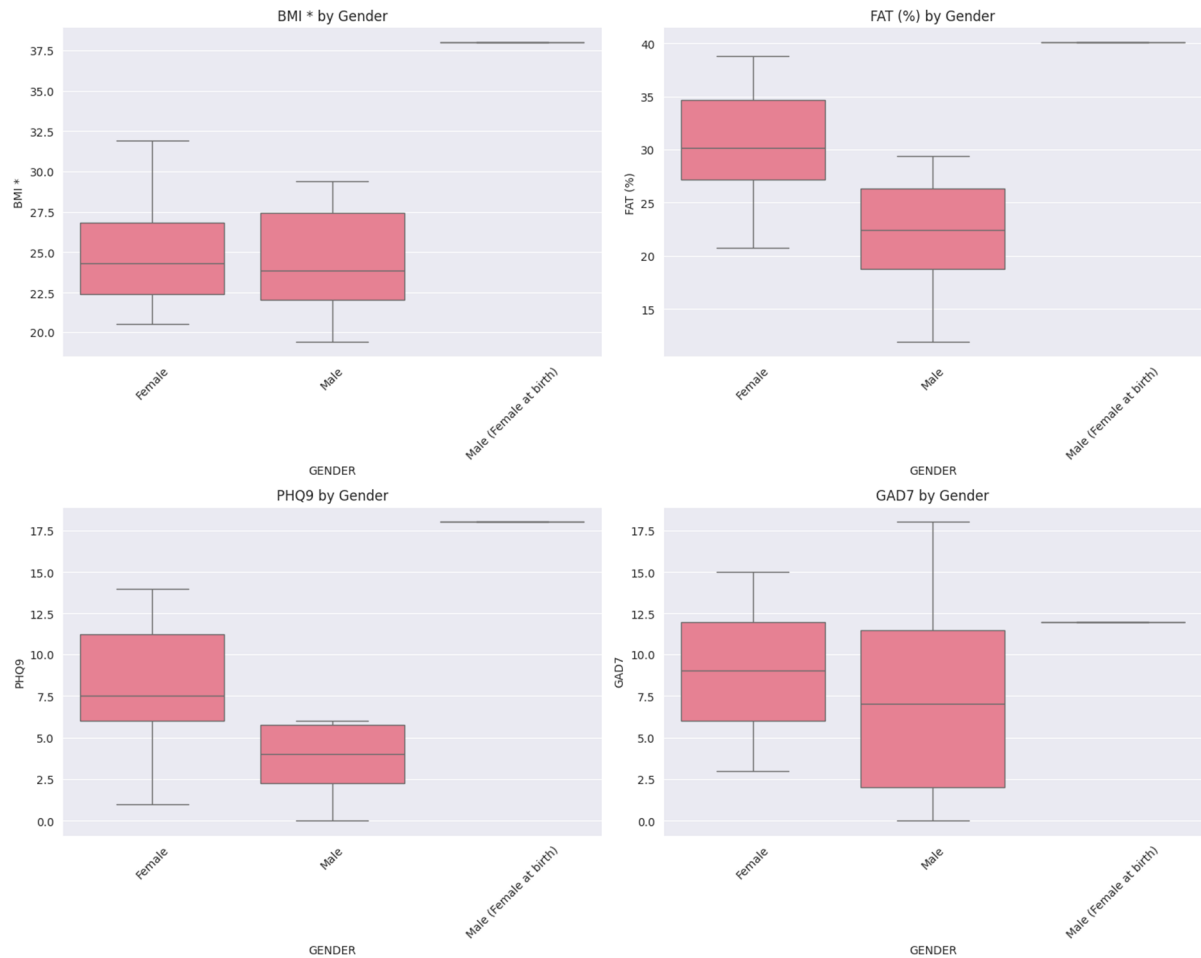
Scatter plots to assess correlation/ key relationships between variables:

  a. **BMI vs Body Fat%:**
    - Positive linear relationship
    - Clear gender clustering
    - Females tend to have higher fat% for same BMI
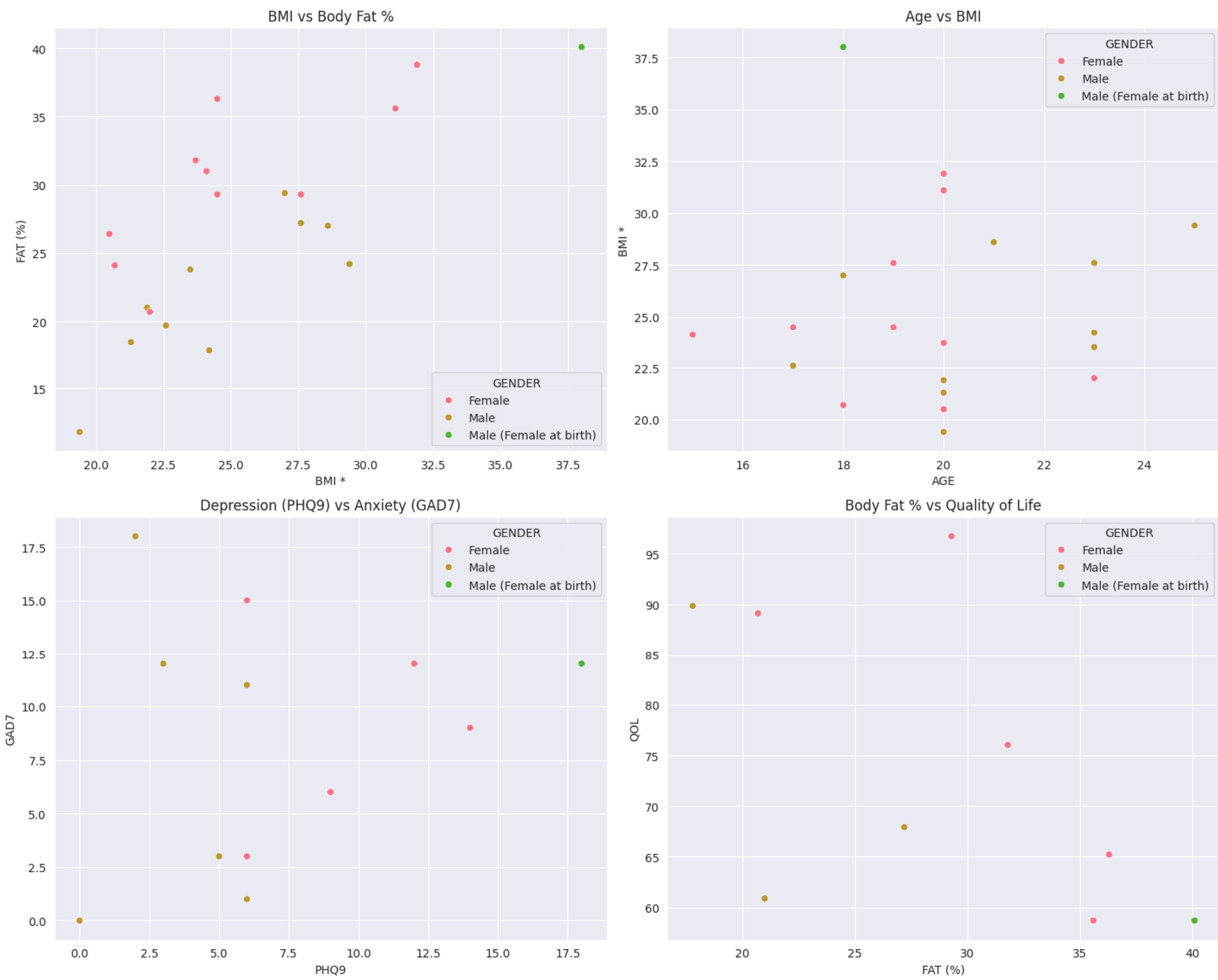 b. **Age vs BMI:**
    - Weak positive relationship
    - No clear gender patterns
    - More scatter in older age groups
  c. **Depression vs Anxiety:**
    - Positive relationship
   - Higher scores in female participants
    - Clustering by gender visible
  d. **Body Fat% vs Quality of Life:**
    - Negative relationship
    - Lower QOL scores with higher body fat%
    - More pronounced in female participants

Comparison of BMI distributions for BP med users vs non-users:

- Box plot shows higher median BMI in BP medication users
- T-test results (t=1.3780, p=0.1842) indicate the difference is not statistically significant
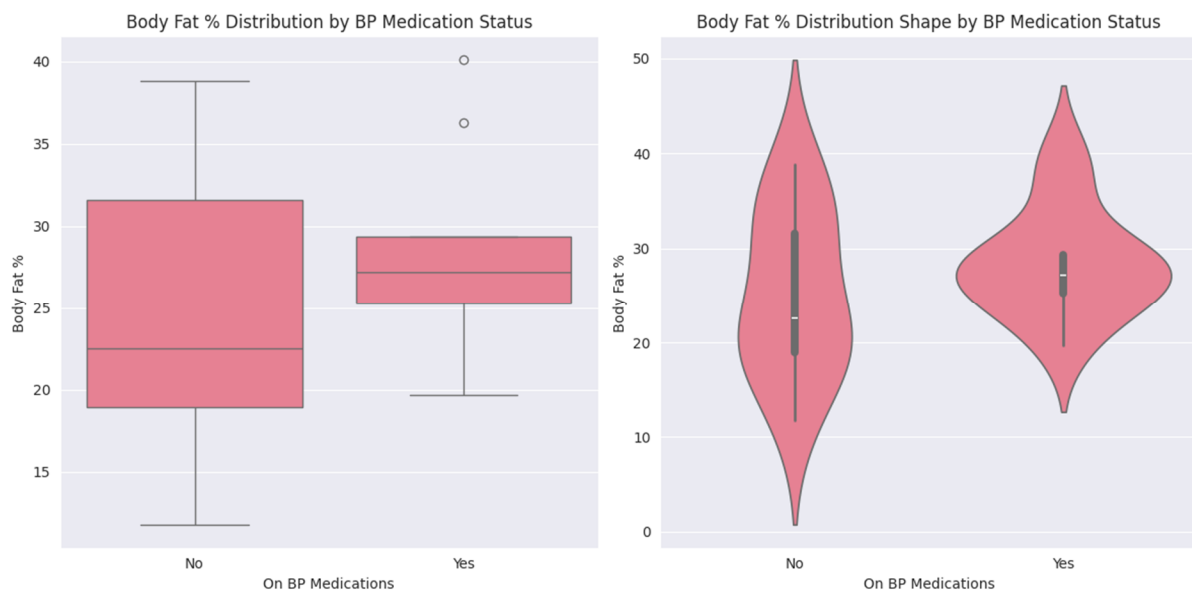- Greater BMI variability in BP medication users

BMI Distribution by BP Medication Status
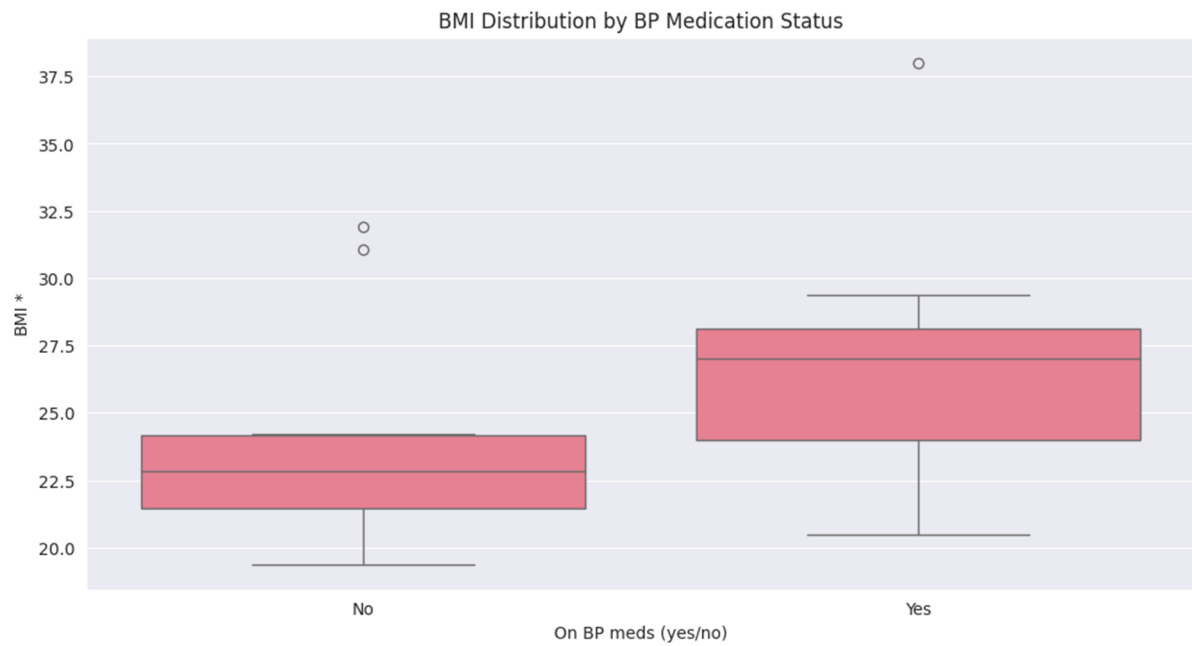
T-test results for BMI difference between BP med users and non-users:

t-statistic: 1.3780

p-value: 0.1842

BP Medication and Body fat Analysis:

Body Fat % Distribution by BP Medication Status

Body Fat % Distribution Shape by BP Medication Status

Descriptive Statistics for Body Fat %

BP Medication Users:

count   11.00

mean   28.43

std   5.69

min   19.70

25%   25.30

50%   27.20

75%   29.35

max   40.10

Name: FAT (%), dtype: float64

Non-BP Medication Users:

count   10.00

mean   25.10

std   8.76

min   11.80

25%   18.97

50%   22.55

75%   31.60

max   38.80

Name: FAT (%), dtype: float64

T-test Results:

t-statistic: 1.0426

p-value: 0.3102

Gender-specific Analysis:

Female:

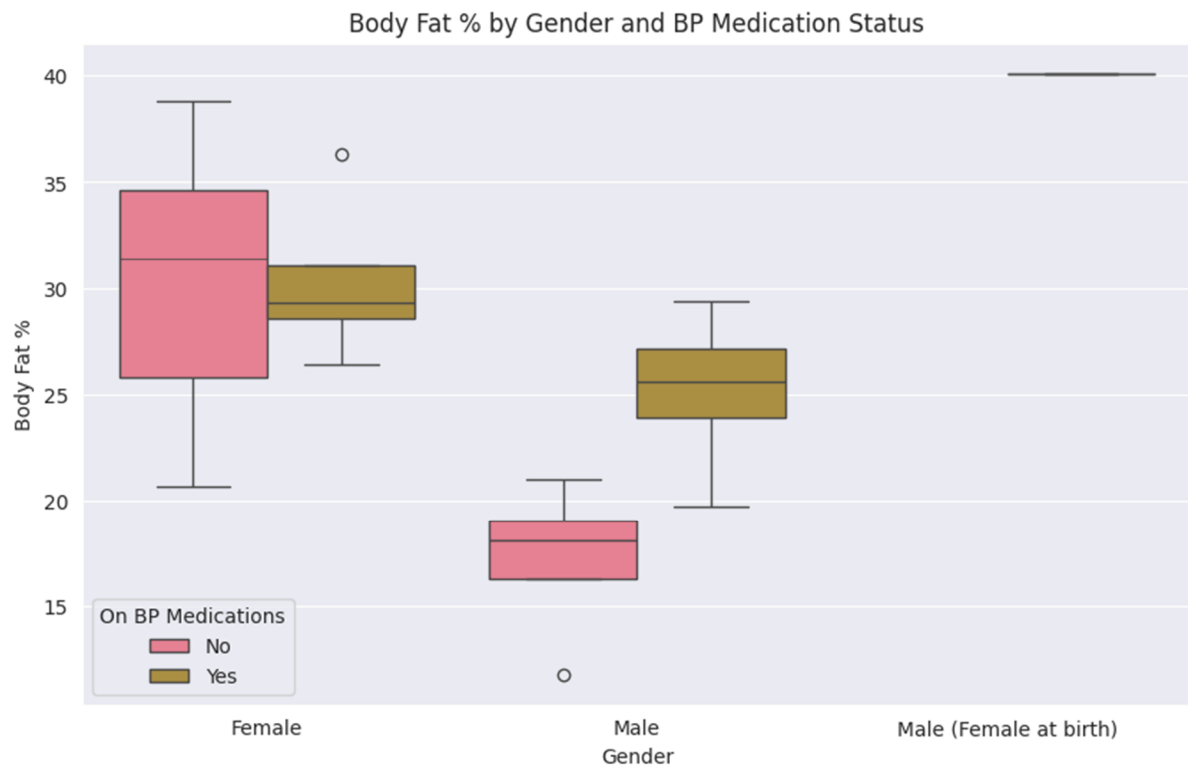Mean Body Fat % with BP meds: 30.32

Mean Body Fat % without BP meds: 30.33

Male:

Mean Body Fat % with BP meds: 25.22

Mean Body Fat % without BP meds: 17.25

BP Medication and Gender Interaction Analysis:

Body Fat % by Gender and BP Medication Status

Group Statistics:

		mean	std	count
GENDER	On BP meds (yes/no)			
Female	No	30.33	6.84	6
	Yes	30.32	4.21	4
Male	No	17.25	3.89	4
	Yes	25.22	3.41	6
Male (Female at birth) Yes		40.10	NaN	1

Female T-test Results:

t-statistic: -0.0022

p-value: 0.9983

Male T-test Results:

t-statistic: 3.4316

p-value: 0.0089

Plot comparison of BMI vs Fat% classifications:

- Shows more "Normal" classifications using Fat% method

- Fewer "Obese" classifications using Fat% method
- Similar "Overweight" classifications between methods
- BMI method classifies more patients as obese than Fat% method

Comparison of BMI vs Body Fat% Classifications
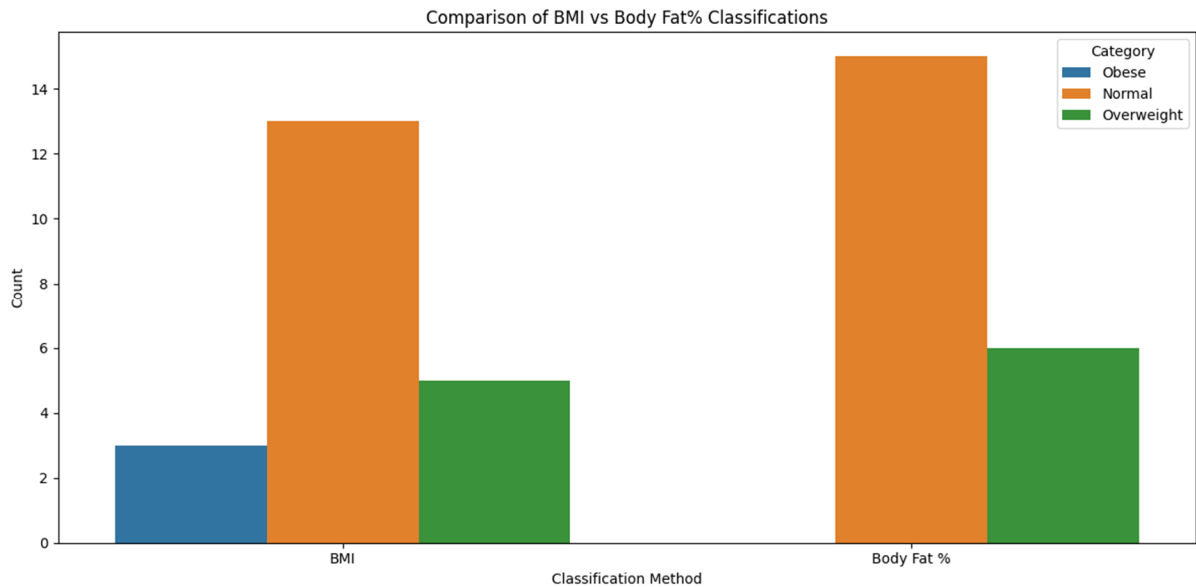
Plot gender-specific comparisons:

- Both methods show higher rates of overweight/obesity in males
- Larger discrepancy between methods in males
- BMI method consistently classifies more patients as overweight/obese compared to Fat% method
- Female classifications show less difference between methods

Overweight/Obese Percentage by Gender and Method