A SURVEY OF DIABETICS PATIENTS ATTENDING PUBLIC SECTOR POLYCLINICS IN BARBADOS.
DEPRESSION AND TYPE 2 DIABETES MELLITUS

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Introduction

- Diabetes mellitus is one of the main threats to human health in 21st century.
- According to IDF there were 366 million people with diabetes in 2011
- Expected to rise to 552 million by 2030
- Ageing population, decreased physical activity and obesity are contributing factors.

Caribbean Prevalence of Diabetes mellitus

Country	Study	Prevalence
Barbados	Hennis et al (2002) Age 40-84 yrs Self report and HbA1C ≥ 10%	17-19.4%
Jamaica	Ferguson et al 2000-2001 2007-2008 Age 15-74 yrs FBS >6.1 mmol/L	 7.2% 7.9%

Burden of Depression

- 1 in 8 individuals may require treatment (Depression Guideline Panel 1993b)
- In primary care, depression rarely presents with classic symptoms
- Complaints of a physical nature:
  - Fatigue
  - Lack of interest activities/sexual activities
  - Sleep/bowel disturbance
  - Somatic complaints

Depression Prevalence

- Worldwide prevalence
  - United States 16.2%
  - United Kingdom 10%
  - Europe 14%
- Caribbean Prevalence
  - Barbados : institutionalized 65-98 yrs

    17.3% sig depression symptoms

    9.2% major depression

Depression Prevalence

- Caribbean Prevalence

- Trinidad, community sample showed a prevalence of 14% and a cross sectional descriptive survey showed a prevalence of 12.8%.

DIABETES MELLITUS AND DEPRESSION

- This discussion has occurred for at least 3 centuries
- English physician Thomas Willis first documented an interaction between psychiatric illness and diabetes mellitus in late 17th century
- He coined the term diabetes mellitus and rediscovered that those who suffered from it urine tasted of honey
- “sadness or long sorrow, diabetes is caused by melancholy”

Prevalence of Depression in Diabetes

- There are limited studies in the Caribbean.
- In Barbados no published studies
- Verbal communication Campbell *et al*, prevalence of depression in diabetics in a tertiary care clinic is 25%.
- Maharaj *et al*, prevalence to be 28% in a chronic disease clinic in Trinidad.
- *P <0.05 when diabetes with another chronic disease*

Prevalence of Depression in Diabetes

- Systematic review of 20 studies since 1988, reported by Gavard *et al* in 1993
- Prevalence 8.5%-27.3% controlled studies
- 11%-19.9% uncontrolled studies
- Meta-analysis Anderson *et al* 11% prevalence of major depression
- Cross sectional survey Nigerian outpatient diabetes clinic, prevalence 19.4%

Screening for Depression

- 2002 USPSTF recommended screening adults for depression in clinical practice
- Systems in place to assure accurate diagnosis, effective treatment, and follow-up.
- There are reliable and valid depression screening instruments
- Generally demonstrate sensitivity 80-90%, specificity 70-85%.

Objectives

- Primary Objective:

- To determine the prevalence and severity of depression among type 2 diabetics in Barbados as measured by the Beck Depression Inventory II and the Patient Health Questionnaire 9.

Objectives cont'd

- Are there any differences in the responses between the Beck Depression Inventory II and the Patient Health Questionnaire 9.
- What are the reasons for presenting to the polyclinic, any common symptoms among the depressed.
- Explore the reliability of the BDI-II and PHQ-9.

STUDY DESIGN

- Cross sectional descriptive survey of type 2 diabetic patients attending 3 polyclinics:

-WSPC,RPPC,ECPC

- Sample size
  - 19% (95%CI±5) prevalence of depression among diabetics
  - Sample size 225
- www.openepi.com

POPULATION SAMPLED

Polyclinic	Population served	Percent	# collected
WSPC	55,000	46%	110
RPPC	45,000	38%	84
ECPC	20,000	16%	36
Total	120,000	100%	230

INCLUSION CRITERIA

- Age 21-75 years
- Diagnosed ≥ 1 year with type 2 diabetes
- Patient of the polyclinic
- Able to provide informed consent

EXCLUSION CRITERIA

- Type 1 Diabetes Mellitus
- Diagnosed < 1 year
- Gestational diabetes
- Age <21 years or >75 years
- Not able to give informed consent

DATA COLLECTION INSTRUMENTS
DEMOGRAPHIC DATA

- Age
- Gender
- Ethnicity
- Education
- Employment status
- # yrs diabetic
- Assoc chronic diseases
- Diabetes treatment
- Complications of diabetes
- Reasons for visit to clinic

Data collection instruments comparison of bdi-ii & phq-9

BDI-II	PHQ-9
21 items	9 items
Self reporting	Self reporting
Ages 13 and older	Adolescents and adults
5-10 mins	5 or less mins
Guttman ranked statements	4 point Likert scale
Score 0-63	Score 0-27
Cut off 14 senst 87.7% spec 83.9%	Cut off 10 senst 88% spec 88%
Good internal consistency	Good internal consistency
Sensitive to change	Sensitive to change

Data collection instruments comparison of bdi-ii & phq-9

BDI-II	PHQ-9
Assess intensity of depression	Depression monitoring
Cost attached	Free of cost
	Added psychosocial impairment

Ethical Issues

- Approval by UWI IRB, MOH
- Informed consent obtained from each participant
- Confidentiality discussed with participants
- If any significant features of depression noted in participants- referred with their permission

Pilot study

12 patients

-15 approached

-3 declined

ECPC

-sample polyclinic

Informed pretest

Not part of final

Time taken to complete questionnaires assessed

Concerns

-problems with demographic questionnaire

-improper wording

Changes made

-questions added

-questions reworded

Data Collection

- Field workers trained by P.I.
- Inclusion and exclusion criteria maintained
- Appropriate dress and approach
- MOH, senior sister of polyclinic informed prior to data collection
- Convenience sample
- Confidentiality maintained

Data analysis
spss version 22

Statistical Analysis	Variable
Descriptive statistics	Categorical variables Continuous variables
Pearson's chi square	Categorical variables
Independent samples t test	Means bet categorical and continuous variables
Pearson product cor coefficient (r)	Correlation continuous variables
Spearman rank coef (rho)	Correlation continuous variables
Kappa measure of agreement	Categorical data
Bland-Altman chart	Agreement bet 2 metric continuous variables
Cronbach's alpha (α)	Internal consistency of scales

RESULTS

- Sample size 230
- 97% response rate
- 76.5% females, 23.5% males
- Mean age 61 years

DEMOGRAPHICS

- ***Length of time diabetic***
  - 57.8% > 10 years
  - 3.5% for 4 years
- ***Other chronic illnesses***
  - 75% HTN
  - 50% arthritis and high cholesterol
  - 10% heart disease
  - 6% H/O stroke

DEMOGRAPHICS

- ***Education***
  - 1° education 36.5%, 2° education 43.5%
- ***Employment***
  - Retired 44.8%, paid 33.5%
  - Occasional 4.8%, unemployed 17%
- ***Complications***
  - Foot 25.7%, eye 22.6%, heart 9.1%
  - Kidney 2.6%, other 6.5%

DEMOGRAPHICS

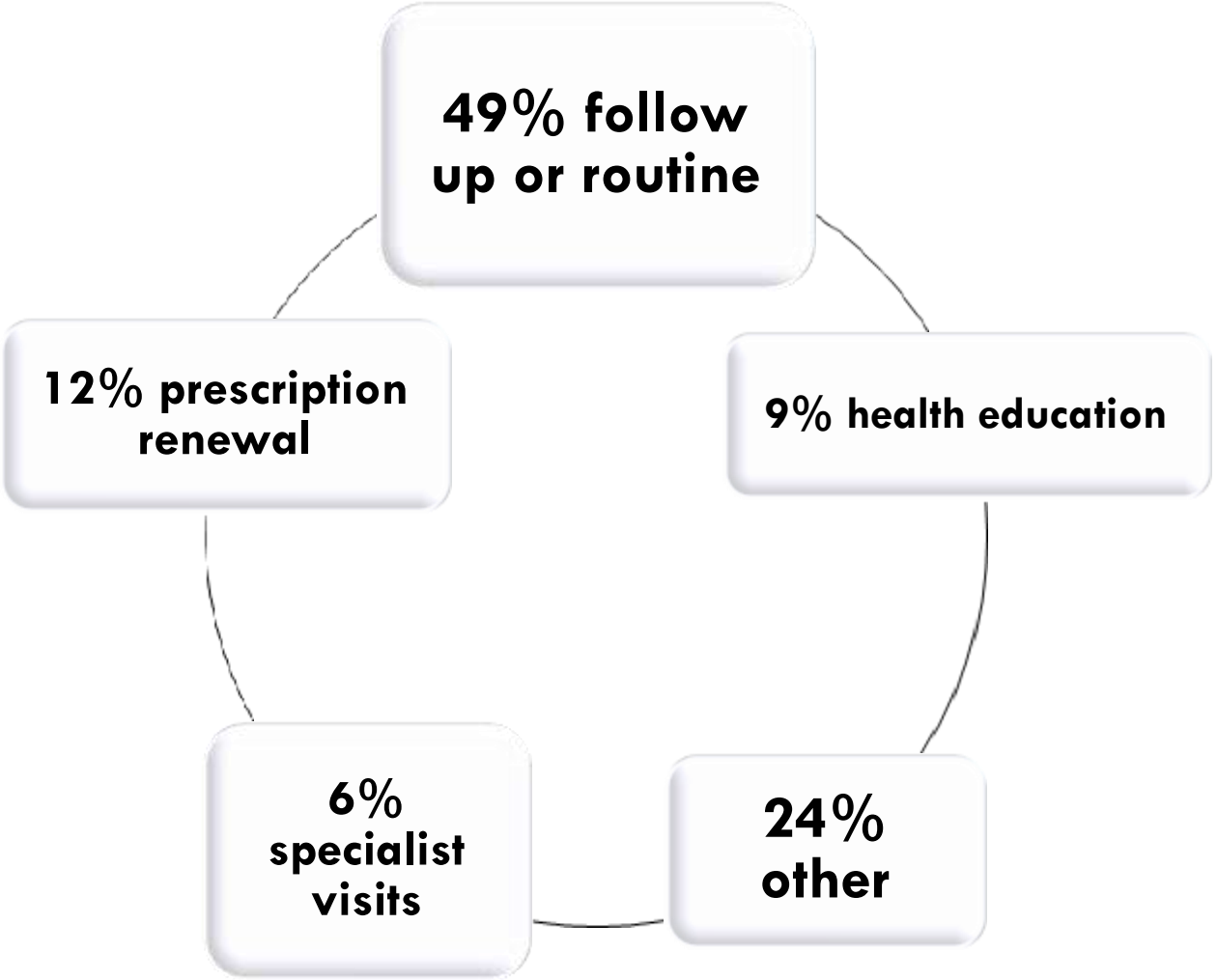
- ***Treatment***

- Tablets only 70%, insulin only 15.2%
- Insulin and tablets 11.3%
- Diet and exercise 2.6%
- No treatment < 1 %

PREVALENCE OF DEPRESSION

- BDI-II cut off score 14 : 7.4% CI 4-11
- PHQ-9 cut off score 10 : 3.5% CI 1-6
- PHQ-9 cut off score 8 : 7% CI 3.6-10

Reasons diabetic patients present to polyclinics



Reasons depressed diabetics (BDI-II) present to polyclinics

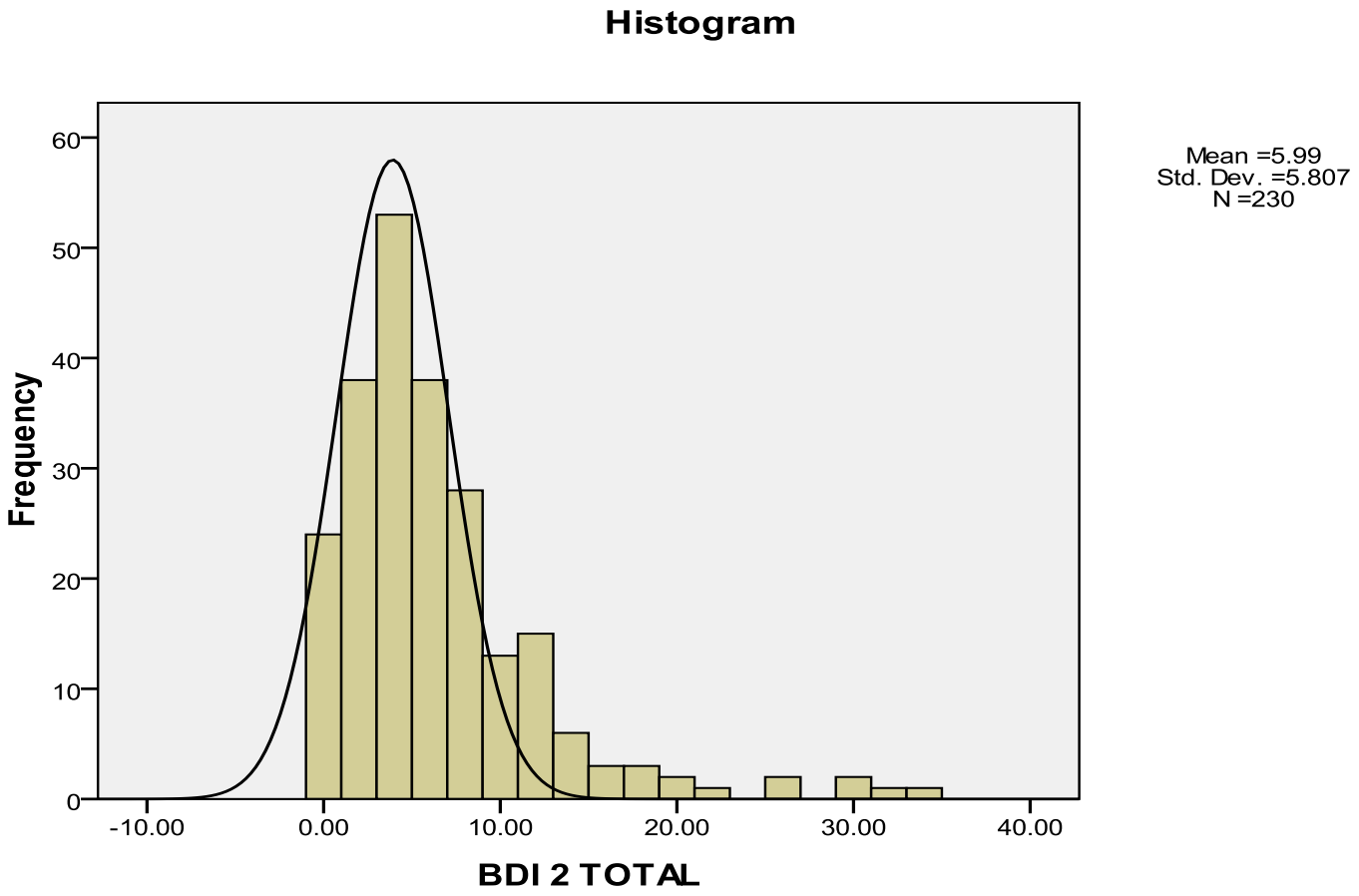
- 41% follow up
- 12% dressings/blood tests
- 6% other

Reasons depressed diabetics (PHQ-9) present to polyclinics

- 38% follow up
- 25% dressings
- 12.5% other

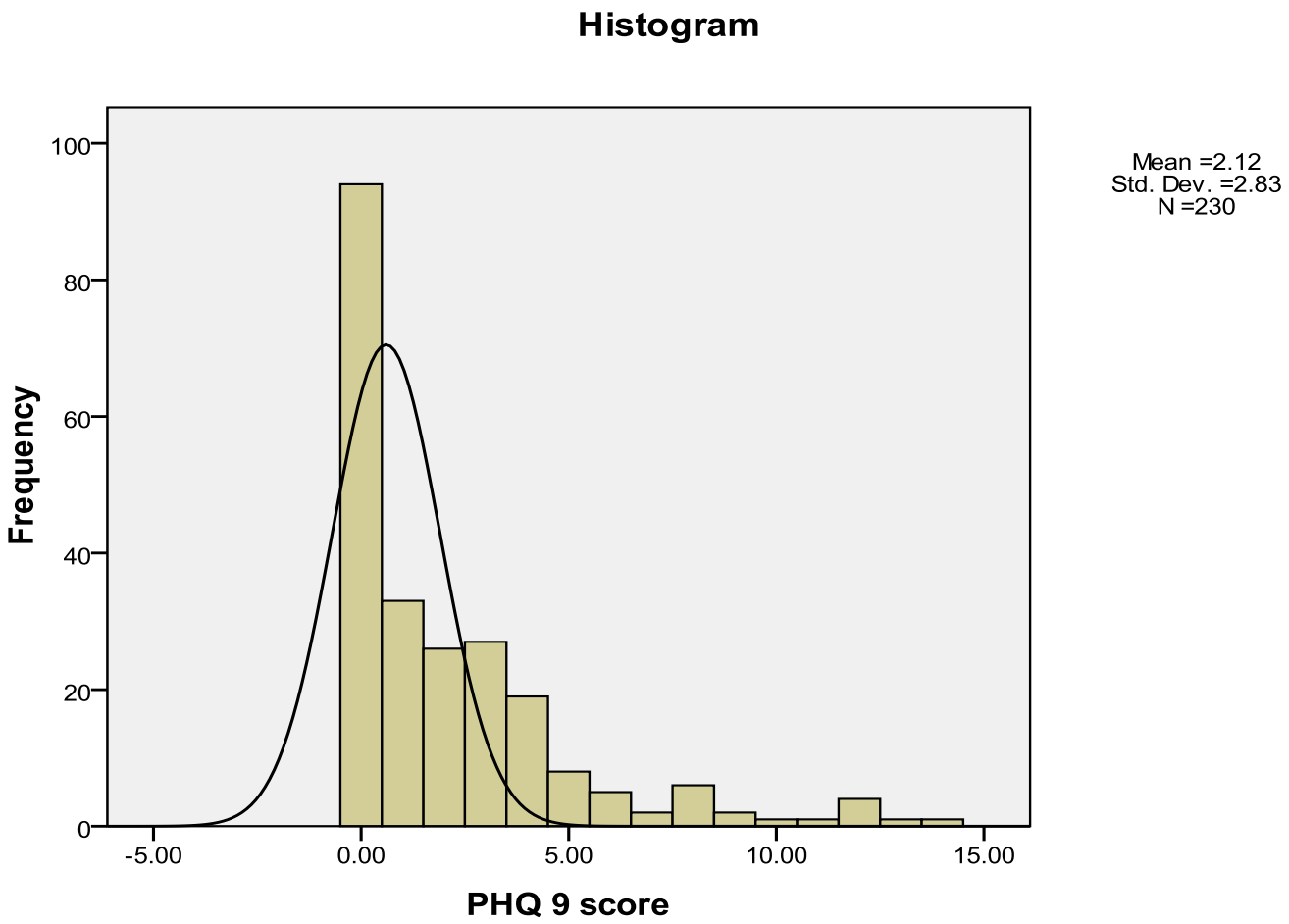
Frequency of BDI-II scores

The mean BDI-II total score is 5.99, the median score is 4.5 and the mode is 3

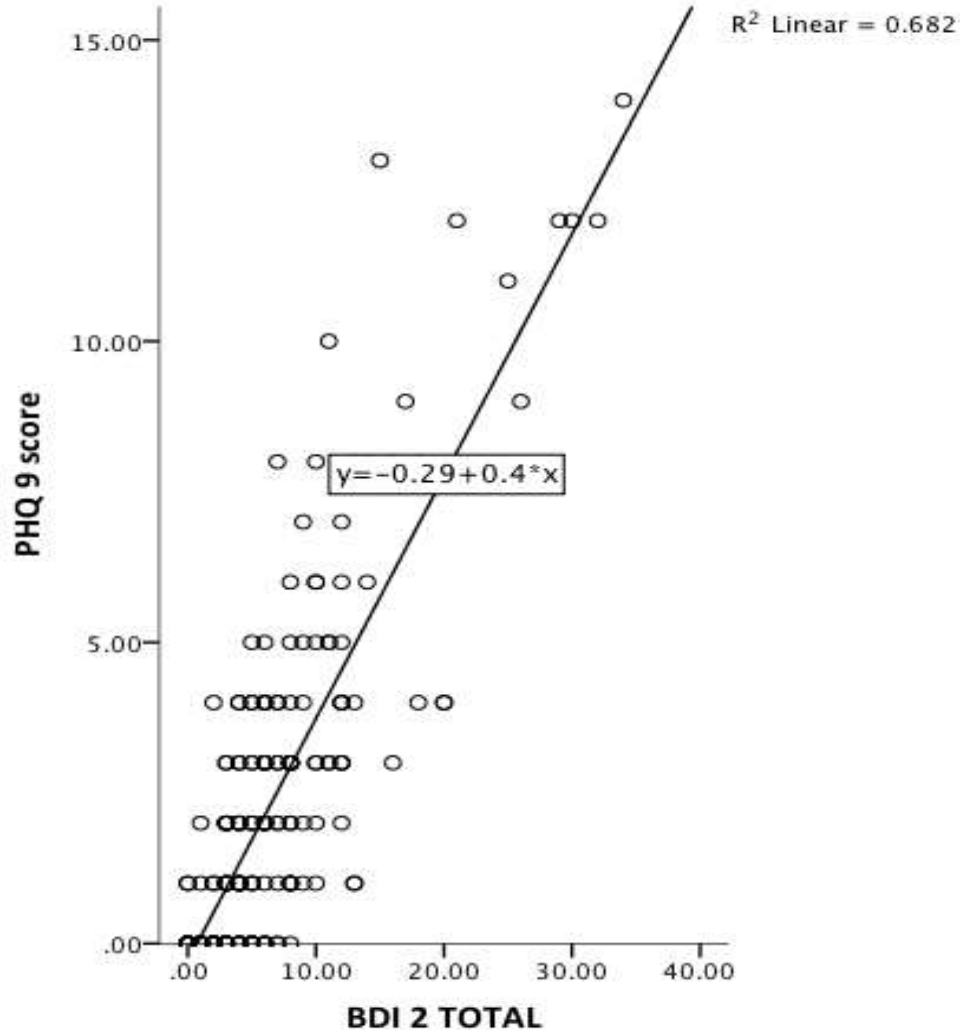


Frequency of PHQ-9 scores

The mean score for PHQ-9 is 2.12, median is 1 and mode is 0



Relationship between BDI-II & PHQ-9



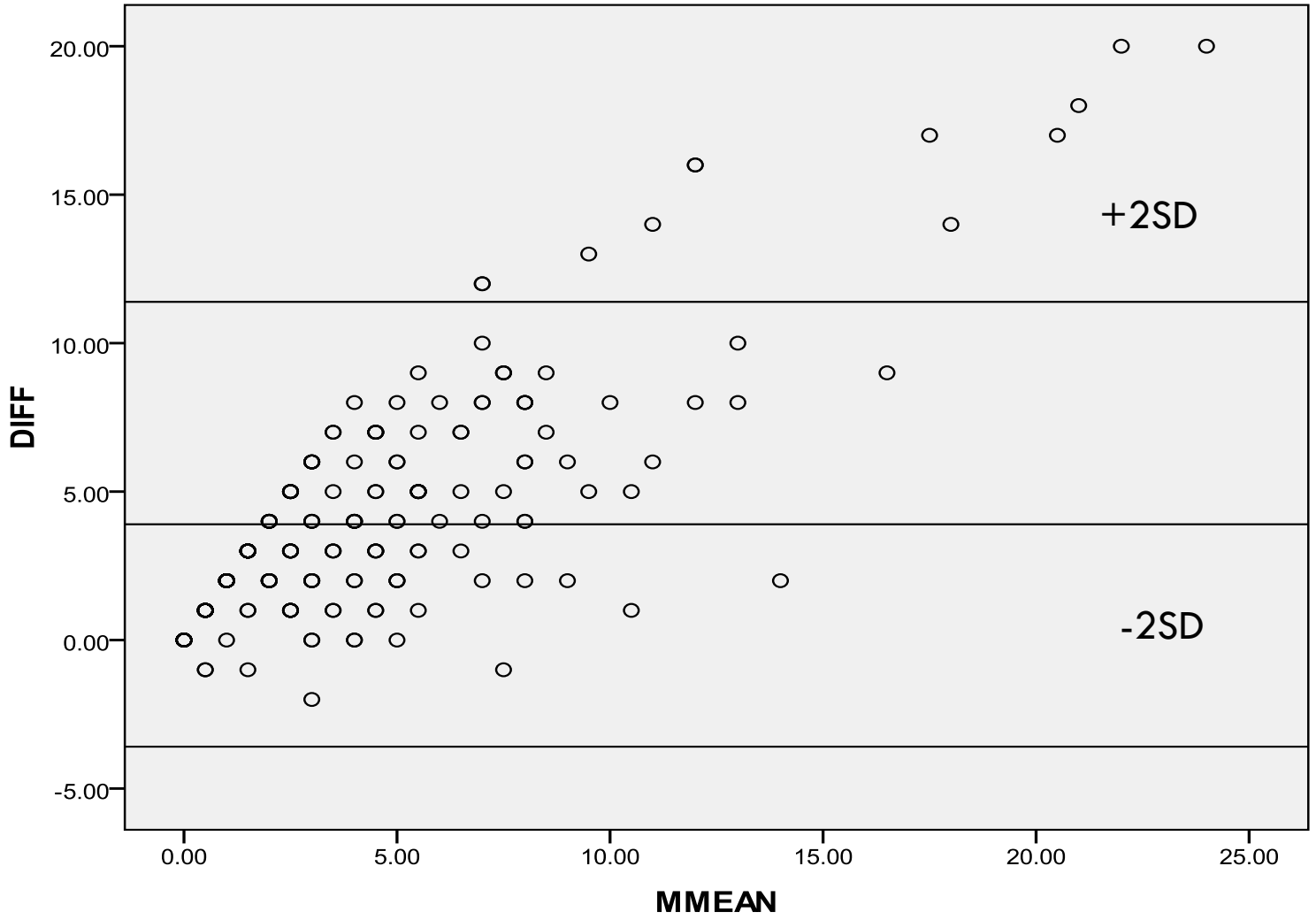
Relationship between BDI-II and PHQ-9

- Pearson product-moment correlation coefficient
- R= 0.826
- N= 230
- P< 0.0005

Agreement between BDI-II and PHQ-9

Statistical Analysis	Results
Kappa coefficient BDI-II (14) vs PHQ-9 (10)	0.538 P < 0.0005 Moderate agreement
Kappa coefficient BDI-II (14) vs PHQ-9 (8)	0.706 P< 0.0005 Good agreement

Agreement between BDI-II and PHQ-9
Bland-Altman analysis



Agreement between BDI-II and PHQ-9 scores
Bland-Altman Analysis

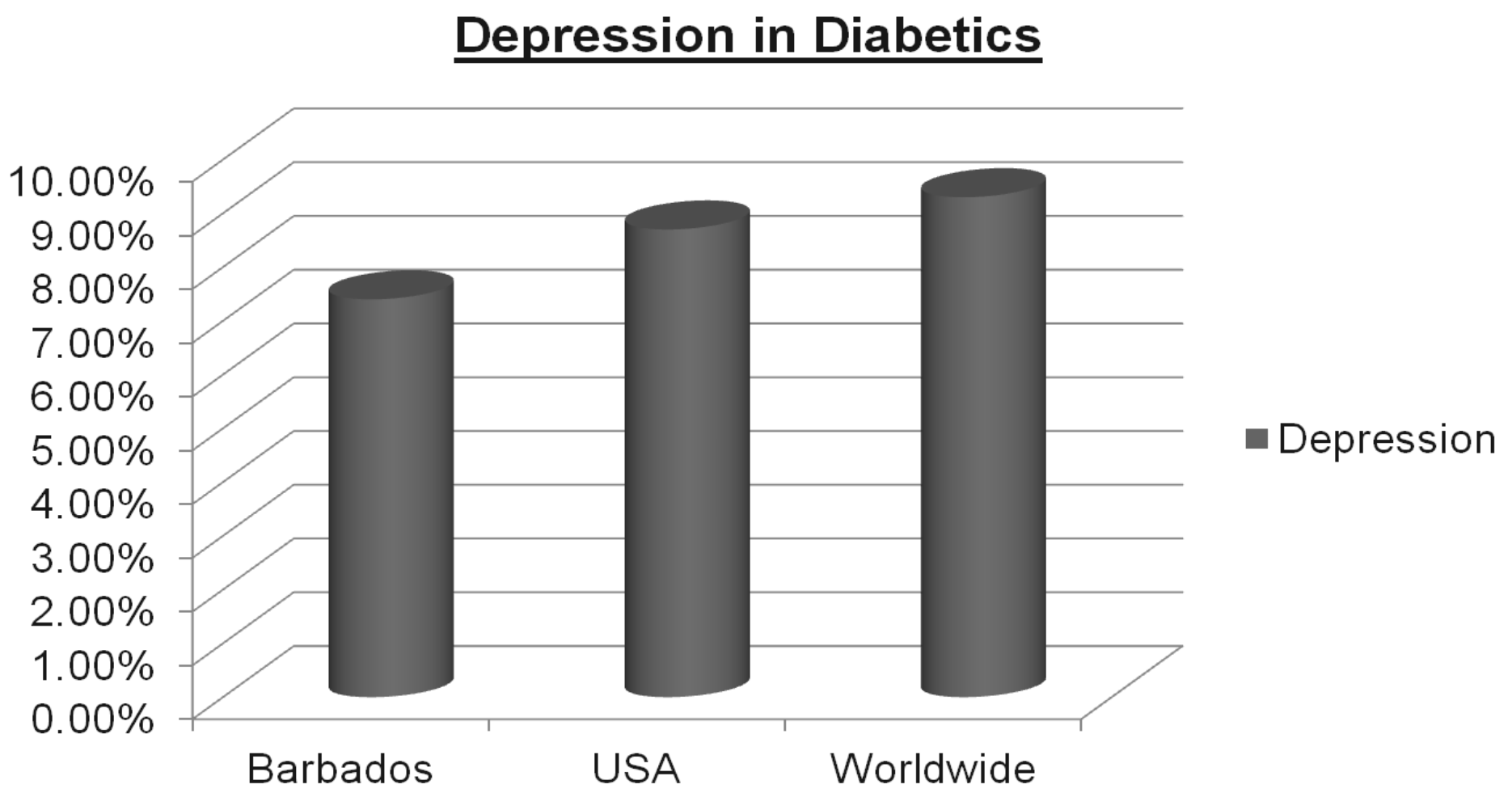
- The analysis indicates that 95% limits of agreement between the two scales ranged from -3.59 to 11.39
- The two methods do not consistently provide similar measures because there is a level of disagreement.

Reliability of BDI-II and PHQ-9

- Cronbach's alpha for BDI-II
  - .84
  - High level of internal consistency
  - α if item deleted, range (.83-.87)
- Cronbach's alpha PHQ-9
  - .78
  - α if item deleted, range (.72-.78)

Discussion

Comparison: Prevalence of Depression in Diabetes Mellitus



Discussion

Prevalence of Depression in Diabetes Mellitus

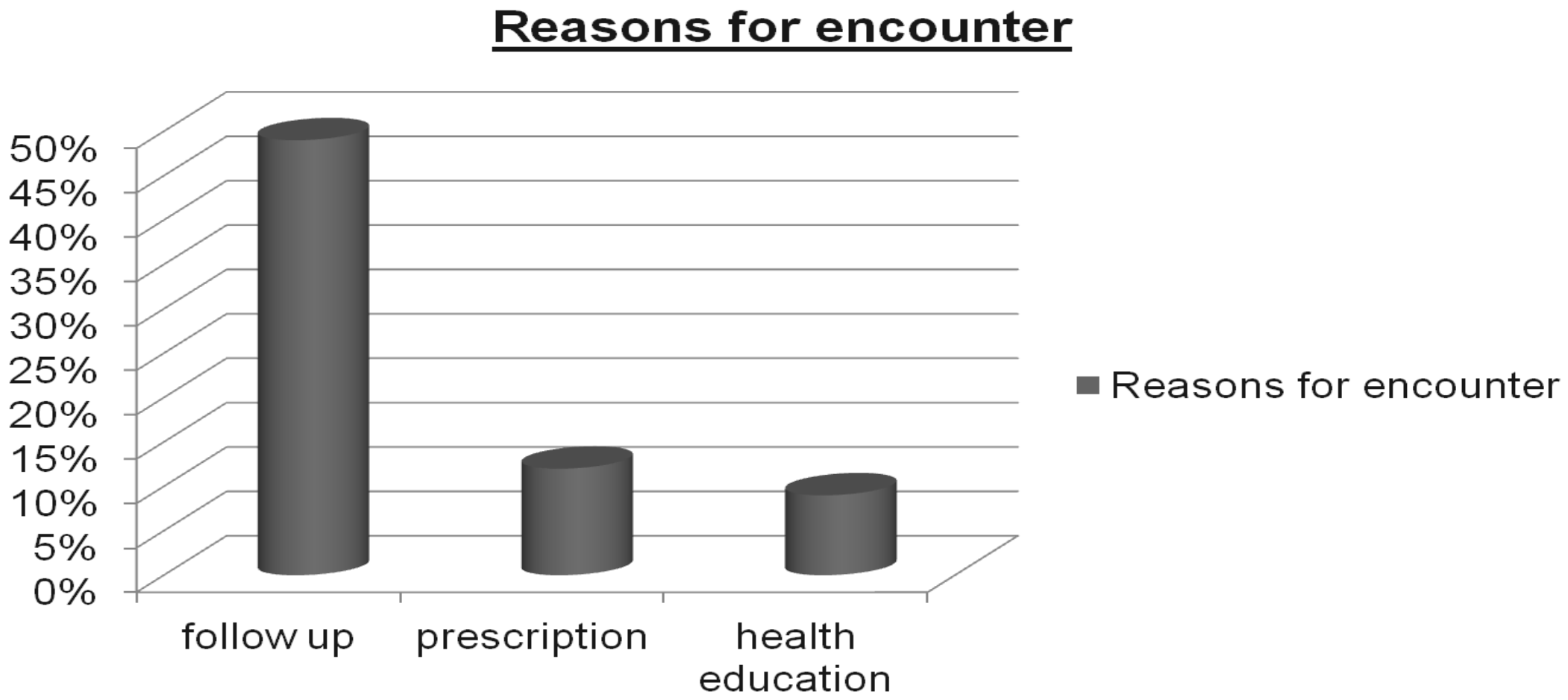
- Walkes *et al* reported 46.6% Barbadians age > 16 yrs enjoy high levels of happiness
- Adams and Carter in 2011
  - Focus group reported low confidence in healthcare providers and may thus under report symptoms
- Study in USA reported some barriers to disclosure of depression:
  - Prescribed antidepressants
  - Lack of confidence in negotiating care

Discussion
Reasons for Encounter

- Cross sectional survey USA 77% of diabetics presented to primary care for follow up
- Of this 72% mentioned a symptom or complaint
- 70-90% of patients with depression or anxiety also complain of somatic symptoms
- Most will admit if asked

Discussion

Reasons for encounter in this study



Reasons for Encounter

- Hoyos *et al* reported 21.9% patients presented in primary care in Barbados for follow up
- Study in Croatia
- Most common reason diabetics present
- Prescription renewal

Discussion
Correlation between BDI-II and PHQ-9

Study/Author	Country	Pearson's coefficient
Present study Principal Investigator Type 2 diabetics	Barbados	.83
Rogers *et al* Cross sectional survey Mental health practices	USA	.87
Diez-Quevedo *et al* General hospital inpatients	Spain	.76
Dum *et al* Out patient substance abusers	USA	.84
Kung *et al* Mood disorder clinic	USA	.77

Discussion
Agreement between the scales

- Bland-Altman plot: plot differences between both scores and mean of both scores
- Plot shows that the two methods do not consistently provide similar measures because there is a level of disagreement.
- By decreasing cut off score for PHQ-9 prevalence becomes equivalent to that of BDI-II

Discussion
Reliability of BDI-II

Study/Author	Country	Cronbach's alpha
Present study Principal investigator Tyoe 2 diabetics	Barbados	.84
Campbell *et al* University students	Barbados	.86
Lipps *et al* Adolescents	Jamaica Bahamas St Kitts and Nevis St Vincent	.88

Discussion
Reliability of PHQ-9

Study/Author	Country	Cronbach's alpha
Present study Principal investigator Type 2 diabetes	Barbados	.78
Kung et al Mood disorder clinic	USA	.89
Dum et al Out patient substance abusers	USA	.90
Adewya et al University students	Nigeria	.85

Limitations of Study

- Convenience sample
- Response bias
  - Questions such as "suicidal ideation" and "interest in sex"
  - Did not instruct participants to vary sequence of 3 questionnaires
- Selection bias – participants may be different
- Privacy sometimes a problem in polyclinics

Conclusions

1. The prevalence of depression among type 2 diabetics in Barbados as measured by BDI-II is 7.4%
2. The prevalence of depression among type 2 diabetics in Barbados as measured by PHQ-9 is 3.5% at a cut off score of 10 but increased to 7% at a cut off score of 8
3. Correlation between the BDI-II and PHQ-9 was good however, agreement was moderate and showed some discrepancy

Conclusions

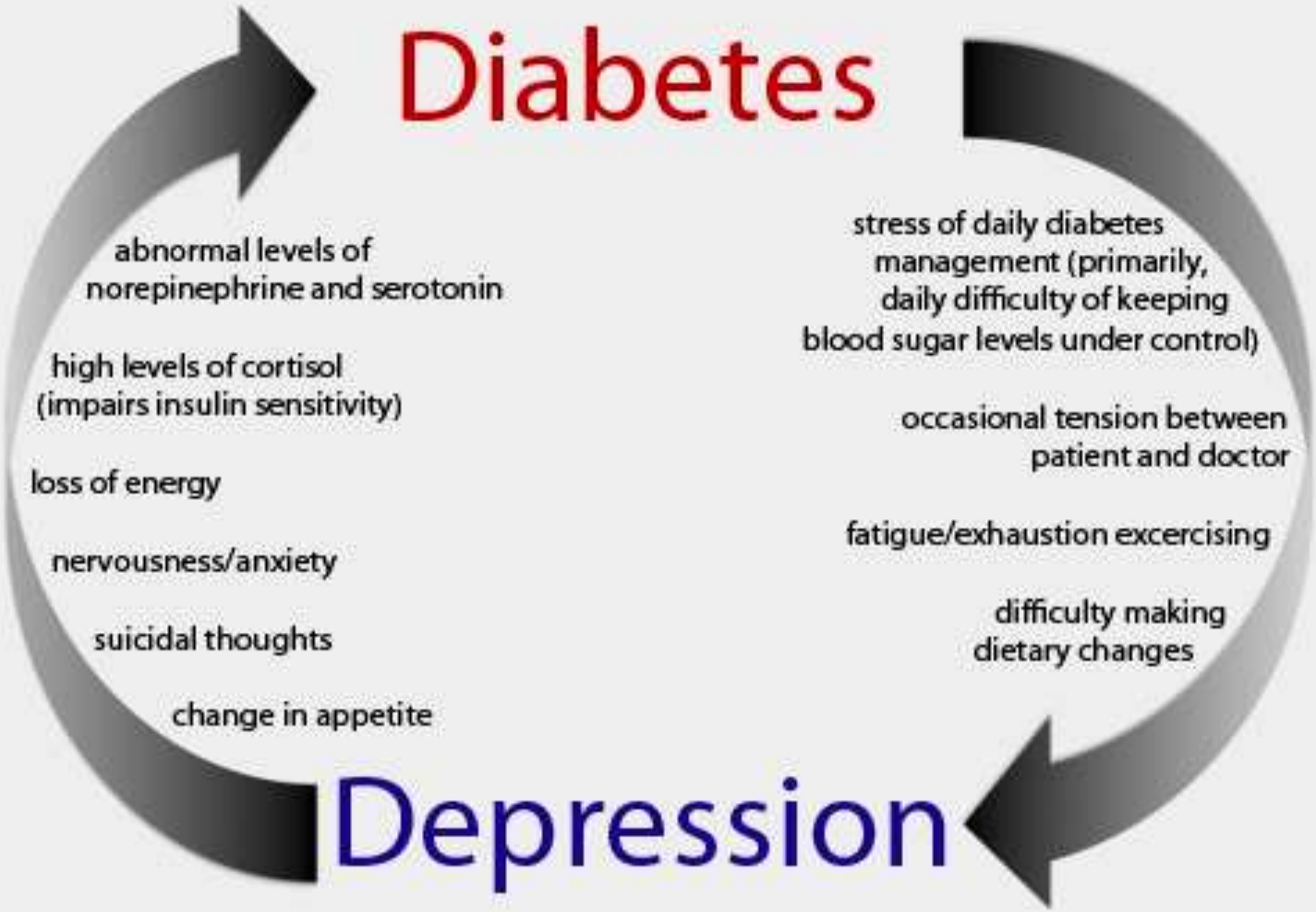
4. BDI-II and PHQ-9 showed good internal consistency (reliability) in our study population.
5. PHQ-9 is still a good option for depression screening as it shows good reliability and is cost effective

Recommendations

1. Screening for depression is advised when support services are in place. Routine assessment of DM by interview or questionnaire.
2. Cost of BDI-II may be a hindrance, consider PHQ-9 as an alternative.
3. Diabetes care should include stress management strategies and coping skills training.
4. CME for doctors and nurses

Future Research

- Prevalence of depression in primary care in Barbados
- Psychometric properties of PHQ-9 in Barbadian population
- Prevalence of depression in type 2 diabetics in private care


Diabetes
stress of daily diabetes management (primarily, daily difficulty of keeping blood sugar levels under control)
occasional tension between patient and doctor
fatigue/exhaustion excercising
difficulty making dietary changes
Depression
change in appetite
suicidal thoughts
nervousness/anxiety
loss of energy
high levels of cortisol (impairs insulin sensitivity)
abnormal levels of norepinephrine and serotonin

QUESTIONS