Diagnostic accuracy of the Patient Health Questionnaire 2 (PHQ-2) in Qatar’s primary care settings

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Abstract

This cross-sectional study was designed to establish diagnostic accuracy of the Patient Health Questionnaire 2 in Qatar’s primary care population. The data required for the study were anonymously extracted from Qatar’s primary care electronic medical record system. The sensitivity, specificity, predictive values, negative values and optimal cut-off points were calculated for the tool. A total of 6921 individuals met the study’s inclusion criteria. The diagnostic accuracy of cut-off values was calculated for scores 1–6. Based on the Youden’s index (0.58), a score of 2 was identified as the most optimal cut-off. It offers a sensitivity of 88.73% and specificity of 69.31%. Further studies should aim to confirm the results using alternative study designs and to report them in accordance to population characteristics both in Qatar and internationally.

Background

Globally, depression is the most common psychiatric disorder in the general population (Liu et al., 2020). It is a major contributor to the disease burden and a leading cause of disability globally (Wang et al., 2017). In primary care settings, depression is the most prevalent mental health condition. Prevalence rates for major depressive disorder range from 3.2% to 27.2% in primary care settings (Craven & Bland, 2013).

Studies have reported under-recognition of depression in primary care (Hirschfeld et al., 1997; Fekadu et al., 2020). While symptoms are prevalent, primary care patients do not discuss them with their doctors. Barriers to diagnosis include patients’ lack of awareness and understanding of the nature of the disease and its symptoms as well as the variability in clinical presentation. It is estimated that 50% of patients with major depressive disorder are not identified (Mitchell et al., 2009). Screening for depression in primary care to provide early identification and intervention is supported by a strong body of evidence (Siniscalchi et al., 2020). Given large estimates of underdiagnosed and undertreated depression, routine screening in primary care can improve the detection rate and reduce the disease burden.

Increased use of screening tools can help improve identification and treatment of depression in primary care settings. The most commonly used tool to screen for depression in primary care is the Patient Health Questionnaire (PHQ) (Mitchell et al., 2016). There are three main formats of the PHQ: PHQ-9 (linear), PHQ-9 (algorithm) and PHQ-2. PHQ-9 includes nine questions, whereas PHQ-2 includes the first two questions of PHQ-9. It is designed as an initial screening tool to be followed by the more comprehensive PHQ-9 and diagnostic interviews.

In Qatar, the current clinical guidelines recommend the use of PHQ-2 as a screening tool for all patients visiting a primary healthcare setting. If the overall PHQ-2 score is ≥ 3, the comprehensive PHQ-9 and diagnostic interviews are undertaken. This study was designed to establish diagnostic accuracy of the PHQ-2 in Qatar’s primary care population. Its findings will inform local and international guideline development for depression screening in primary healthcare settings.

Methods

Study setting

The study was conducted in Primary Health Care Corporation (PHCC) in Qatar. PHCC is a public sector organisation that delivers primary care to approximately 70% of the country’s population through 28 health centres.
data collected for it were anonymised. None of the subjects
The study presented a minimal risk of harm to its subjects, and the
Ethical considerations
The study presented a minimal risk of harm to its subjects, and the
data collected for it were anonymised. None of the subjects’ per-
sonal information was available to the research team. Overall,
the study was conducted with integrity according to generally
accepted ethical principles and was reviewed and approved under
the exempt review category by the PHCC’s research subcommittee
(PHCC/DCR/2020/03/017).

Results
A total of 6921 individuals met the study’s inclusion criteria. The
mean age of those included was 40.4 years and 63% were women.
Depression was diagnosed in 17.9% of the study population. The
mean PHQ-2 score was 1.6.
The diagnostic accuracy of cut-off values was calculated for
scores 1–6 (see Table 1). Based on the Youden’s index (0.58), a
score of 2 was identified as the most optimal cut-off. It offers a sen-
sitivity of 88.73% and specificity of 69.31%.

Discussion
This study is the first to report diagnostic accuracy of the PHQ-2 in
Qatar’s primary care population and potentially in the Gulf
Cooperation Countries (which have similar population character-
istics as Qatar). Its findings demonstrate the PHQ-2 tool has a high
diagnostic accuracy in Qatar’s primary care settings.

The tool was found to be very sensitive for a diagnosis of depression with sensitivities of 95% and 88% for thresholds of ≥1
and ≥2, respectively. However, it had a modest specificity of 57%
and 69%, respectively, at these cut-off values. The finding that a
score of ≥2 was more successful in detecting cases of depression than the current score ≥3 suggests that it may be too high for clini-

cal practice. A systematic review and meta-analysis also concluded
that ≥2 may be preferable if clinicians want to ensure that few cases
of depression are missed. Another systematic review and meta-
analysis reported that the combination of PHQ-2 (with cut-off ≥2) followed by PHQ-9 (with cut-off ≥10) had similar sensitivity
but higher specificity compared with PHQ-9 cut-off scores of 10 or
greater alone (Levis et al., 2020). Cut-off scores of ≥2 are sup-
ported by other studies and healthcare settings (Yu et al., 2011;
Thombs et al., 2014; Carey et al., 2016; Gelaye et al., 2016;
Scoppetta et al., 2021). Therefore, it is recommended that clinical
guidelines are reviewed and revised taking these findings into con-
sideration. Using a higher cut-off value may be a reason for under-
diagnosed in primary healthcare settings as reported by previous
studies (Mitchell et al., 2009).
The study’s strength includes a large sample and reliable data
recorded by qualified healthcare professionals and extracted from
an EMR system. The system reports an overview of PHQ-2 diagnos-
cnic accuracy in Qatar’s primary care settings. This facilitates develop-
ment of clinical guidelines that can enhance diagnosis of depression. The limitations of the study include the following: a
cross-sectional study design which provides a snapshot in time.
Furthermore, the study included only patients who were 18 years
and above and those who completed a PHQ-2 questionnaire. Also,
the clinical diagnosis of depression is subject to diagnostic variabil-
ity among clinicians.

The study demonstrates the PHQ-2 is most effective with a cut-
off score of ≥2 in Qatar’s primary care settings. Clinical guidelines
in the country should be aligned with the findings. Further studies
should aim to confirm the results using alternative study designs
and to report them in accordance to population characteristics
both in Qatar and internationally.

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undertook the data analysis. MAS drafted the manuscript. All authors revised
and approved the final manuscript.

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Conflicts of interest. None.
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