PHILIPPINE CLINICAL PRACTICE GUIDELINES for the Screening and Diagnosis of Obesity in Adults

As of October 5, 2023

Disclaimer and Contact Information

This clinical practice guideline is intended primarily for the use of health professionals in the primary care setting, such as physicians, nurses, midwives, and barangay health workers. Although the Department of Health encourages clinicians to adhere to this guideline, clinical judgment must still be exercised when dealing with individual cases. Patients may vary in innumerable ways: from their clinical history, current physical status, and treatment response, to their values, needs and preferences. Hence, users of this guideline must ensure that sound clinical decision-making is practiced to account for this variability.

The guideline may also be used by payors and policymakers, including hospital administrators and employers. However, this guideline must not be treated as strict rules to base legal action, and nonconformance to the recommendations written herein should not be the primary basis for providing or denying financial aid.

The guideline developers are aware of its limitations. The evidence base used is composed of the best available scientific evidence at the time this guideline was made. Given this, it is likely that the certain aspects of the interventions or diagnostic tests were not completely covered by the included studies.

Contact Us

Reach us through nemie.nicodemus@gmail.com for any questions or clarifications on the processes and information contained with this CPG.

Acknowledgments

This clinical practice guideline on the screening and diagnosis of obesity was prepared by the Vicente Sotto Memorial Medical Center, the Philippine Association for the Study of Overweight & Obesity, and the National Institutes of Health - Institute of Clinical Epidemiology.

The guideline development was supported by a grant from the Department of Health. However, the Department of Health did not exert any influence or impose any condition on the implementation of the project or on its final outputs.

The Vicente Sotto Memorial Medical Center, the Philippine Association for the Study of Overweight & Obesity, and the National Institutes of Health - Institute of Clinical Epidemiology are grateful for the diligence and perseverance of the Task Force Steering Committee, who provided guidance during the development of the clinical practice guideline, and for the hard work of the Technical Working Group, who were responsible for creating the evidence summaries and the draft recommendations. We also recognize the indispensable contribution of the Consensus Panel, which was composed of representatives from different sectors of healthcare, for their expert assessment of scientific evidence and their insights on the feasibility, applicability, and equity of these interventions upon finalizing the recommendations. Finally, we acknowledge the efforts of the external reviewers for their valuable suggestions in improving the manuscript and its presentation.

Suggested citation: Department of Health. Philippine Clinical Practice Guidelines for the Screening and Diagnosis of Obesity. 2023. Available from: [URL]

Participating Societies, Organizations, Agencies and/or Institutions

Nutritionist Dietitians Association of the Philippines

Philippine Academy of Family Physicians

Philippine Academy of Rehabilitation Medicine

Philippine Alliance of Patient Organizations

Philippine Association for the Study of Overweight and Obesity Inc.

Philippine College of Endocrinology, Diabetes, and Metabolism, Inc

Philippine College of Medical Nutrition Physicians

Philippine College of Occupational Medicine

Philippine College of Physicians

Philippine Heart Association

Philippine Obstetrical and Gynecological Society

Philippine Psychiatric Association

Philippine Society of Gastroenterology

Philippine Society of Metabolic and Bariatric Surgery

List of Abbreviations

ACR	American College of Radiology
ALT	alanine transaminase
AST	aspartate transferase
AUC	area under the curve
AUS	Australian dollar
BMI	body mass index
CI	confidence interval
COI	conflict of interest
CPAP	continuous positive airway pressure
CPG	clinical practice guideline
CV	cardiovascular
DALY	disability-adjusted life-year
DASH	Dietary Approaches to Stop Hypertension
DOH	Department of Health
EtD	Evidence-to-Decision
FBS	fasting blood sugar
FT4	free thyroxine
GLP-1-RA	GLP-1 receptor agonist
GRADE	Grading of Recommendations, Assessment, Development, and Evaluations
HbA1C	glycated haemoglobin
HDL	high-density lipoprotein
HR	hazard ratio
ICER	incremental cost-effectiveness ratio
LDL	low-density lipoprotein
LR-	negative likelihood ratio
LR+	positive likelihood ratio
MACE	major adverse cardiovascular event
MAFLD	metabolic-associated fatty liver disease
MD	mean difference
NAFLD	non-alcoholic fatty liver disease
NASH	non-alcoholic steatohepatitis
OCP	oral contraceptive pill
OGTT	oral glucose tolerance test
OSA	obstructive sleep apnea
OR	odds ratio
PCOS	polycystic ovarian syndrome
PHEX	Philippine Guidelines on Periodic Health Examination
PHIC	Philippine Health Insurance Corporation
PHP	Philippine peso
PHQ-9	Patient Health Questionnaire-9
PICO	population, intervention, comparator, outcome
QALY	quality-adjusted life-year
RCT	randomized controlled trial
RR	risk ratio
SAE	serious adverse event
SMD	standardized mean difference
TSH	thyroid-stimulating hormone
USD	United States dollar
WHO	World Health Organization
WHO-APP	WHO Asia-Pacific population
WHR	waist-to-hip ratio
WMD	weighted mean difference

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Executive Summary

The prevalence of obesity among Filipino adults continues to rise, putting more Filipinos at risk for non-communicable diseases. Persons who are overweight and obese present with unique risk factors and heightened predisposition for select disease; thus, early diagnosis is essential. This clinical practice guideline (CPG) aims to provide recommendations on the diagnosis of overweight and obesity and on the screening for obesity-related risk factors and health conditions among adults. Other aspects of management will not be covered in this guideline. It is intended to be used by general physicians and specialists, other healthcare professionals, policymakers to improve management among individuals with obesity. Its target beneficiaries are the patients with obesity, and indirectly the whole of society in the Philippines.

A Steering Committee, a Technical Working Group, a multi-sectoral Consensus Panel, and an oversight committee were involved in different stages of guideline development, following the methodology described in the Department of Health (DOH) CPG Manual 2018. The current guideline focuses on answering twelve clinical questions using current best available evidence from published research, local resources, and practice context. Recommendations were drafted by the evidence review experts and finalized by the Consensus Panel. The Grading of Recommendations, Assessment, Development, and Evaluations (GRADE) method was used to determine the direction and strength of each recommendation.

Twelve recommendations were developed for the 12 clinical questions and their corresponding evidence summaries (Table 1). Of these, a majority were strong recommendations despite being based on low to very low certainty of evidence due to the benefits and feasibility of diagnosis and screening. Other recommendations require further research to improve our confidence in recommending these interventions for the management of adults with obesity.

Summary of Recommendations

Table 1. Recommendations on the diagnosis of obesity and the screening for obesity-related risk factors and health conditions

No.	Recommendations	Certainty of Evidence	Strength of Recommendation
1	Among adult Filipinos, we **recommend the use** of the Asia-Pacific criteria rather than the World Health Organization global criteria for body mass index to diagnose overweight and obesity.	Very Low	Strong
2	Among adult Filipinos, we **suggest the use** of waist circumference and waist-to-hip ratio in addition to body mass index to diagnose obesity.	Very Low	Weak
3	Among adult Filipinos, we **suggest screening** for hypothyroidism using thyroid-stimulating hormone among adults aged ≤70 years old at the initial visit.	Very Low	Weak
4	Among adult reproductive-aged Filipino women, we **recommend screening** for polycystic ovarian syndrome using the Rotterdam criteria at the initial visit.	Low	Strong
5	Among adult Filipinos with obesity, we **suggest screening** for dysglycemia using 75-gram oral glucose tolerance test once a year.	Very Low	Weak
6	Among adult Filipinos with obesity, we **recommend screening** for dyslipidemia using a fasting lipid profile.	Very Low	Strong
7	Among adult Filipinos with obesity, we **recommend screening** for hypertension using a non-invasive blood pressure measurement with an appropriately sized cuff at least once a year.	Very Low	Strong
8	Among adult Filipinos with obesity, we **suggest screening** for non-alcoholic fatty liver disease using liver ultrasound.	Very Low	Weak
9	Among adult Filipinos with obesity, we **suggest screening** for obstructive sleep apnea using the STOP-BANG questionnaire once a year.	Very Low	Weak
10	Among adult Filipinos with obesity, we **recommend screening** for depression using the Patient Health Questionnaire-9 tool every 6 months.	Very Low	Strong
11	Among adult Filipinos with obesity, we **recommend screening** for osteoarthritis using the American College of Rheumatology clinical classification criteria at every visit.	Very Low	Strong
12	Among adult Filipinos with obesity, we **recommend screening** for use of obesogenic medications for other health conditions at every visit.	Low	Strong

Introduction

Background

The World Health Organization (WHO) defines overweight and obesity as an “abnormal or excessive fat accumulation that presents a risk to health” [1]. More recently, the Obesity Medicine Association updated this definition and defines obesity as “a chronic, progressive, relapsing, and treatable multi-factorial, neurobehavioral disease, wherein an increase in body fat promotes adipose tissue dysfunction and abnormal fat mass physical forces, resulting in adverse metabolic, biomechanical, and psychosocial health consequences” [2]. It is a condition present in more than 1.9 billion adults (39%) worldwide as of 2016, and in about 36.6% of Filipino adults in 2019 [3,4]. Although believed to be a condition predominant in high-income countries, the prevalence of overweight and obesity continues to rise in low- and middle-income countries such as the Philippines where prevalence has nearly doubled since 1998. An individual can be classified as having overweight or obesity using simple anthropometric measures such as body mass index (BMI) and waist and hip circumference measurements. Standard values based on European populations have been used in the diagnosis of overweight and obesity, but in recent years, it has been proposed that Asian countries use cut-off levels distinct from other ethnicities due to their differing level of risk for non-communicable diseases [5–7].

Obesity results primarily from the imbalance between increased caloric intake and decreased caloric expenditure (e.g., overeating, low energy expenditure, physical inactivity), which are brought about by a variety of factors (including environmental, genetic, biologic, and social factors) [8,9]. Hypothyroidism, for example, is a common endocrine abnormality that contributes to weight gain through an unfavorable lipid profile, increased cardiovascular (CV) risk factors, and features of metabolic syndrome [10]. Medications for other conditions may also cause obesity and may negatively impact the efficacy of treatment [11].

Having overweight or obesity increases an individual’s risk for developing various non-communicable diseases. It is a component of metabolic syndrome, which includes other conditions: insulin resistance, atherogenic dyslipidemia, and elevated blood pressure [12]. Central obesity is also an independent risk factor associated with polycystic ovary syndrome (PCOS), and women with PCOS are more likely to have metabolic syndrome [13]. Increased adiposity surrounding the airways may lead to the development of obstructive sleep apnea (OSA) and increase the risk of adverse CV events [14]. Increased visceral adiposity also leads to lipolysis and the release of free fatty acids which accumulate in organs such as the liver [15]. Obesity could also lead to the development of other health conditions such as depression and osteoarthritis, both of which limit physical activity [16,17].

Given the increased risk of persons with obesity for several health conditions, the diagnosis of overweight or obesity and screening in this specific population are vital for early detection and early intervention. These, in turn, may prevent disease development or improve prognosis for certain conditions.

Objectives

This CPG aims to define best practices in screening and diagnosis of obesity and its associated conditions among Filipino adults by conducting a comprehensive and systematic assessment of the benefit, harm, and cost of select screening and diagnostic tests.

Scope and Purpose

This CPG covers the screening and diagnosis of obesity among non-pregnant adults, including screening tests, screening for risk factors, and determination of underlying etiology (Table 2). As obesity is a prevalent health condition among Filipino adults [4], it is necessary to set standards for screening and diagnosis of overweight and obesity based on the best available evidence.

Questions related to the treatment of obesity or questions on the pediatric population are not be covered. Although interventions for select conditions covered in this CPG are mentioned in the evidence summaries as part of the screening cascade, they are not to be equated as the guideline developers' recommended treatments. The guideline developers acknowledge that other management options may not have been covered by the evidence included in this CPG and that the evidence of the current review is not sufficient to recommend a particular course of management of any of the conditions covered in the CPG.

Target Population

The majority of recommendations of this CPG will apply to non-pregnant adults who have overweight or obesity. Recommendations for children and adolescents are not covered by this CPG.

Intended Users

This CPG is intended for use in the primary care setting by physicians, nurses, midwives, barangay health workers and other allied health professionals. The Philippine Health Insurance Corporation (PHIC), payers and policymakers, including hospital administrators and employers, can also utilize this CPG.

Key Clinical Issues and Questions

Table 2. Review questions on the diagnosis of obesity and the screening for obesity-related risk factors and health conditions

Question 1	**Should we use the Asia Pacific cut-off for body mass index instead of the World Health Organization values to diagnose overweight and obesity among adult Filipinos?**
Population	Adult Filipinos
Intervention	BMI, Asia-Pacific cut-off
Comparison	BMI, WHO cut-off
Outcomes	**(a)** weight-related complications (DM, DLD, HTN, CVD and mortality, NAFLD/NASH, OSA, etc.), **(b)** sarcopenia, **(c)** ACM, **(d)** QOL, **(e)** psychological outcomes (body image perceptions, depression score, anxiety disorder), **(f)** eating behaviors, **(g)** harm (of doing the test), **(h)** diagnostic accuracy (Sn, Sp, LRs)
Subgroups	**(a)** age (adults, older persons), **(b)** sex, **(c)** risk factor (DM, DLD, HTN, CVD and mortality)
Question 2	**Should waist circumference or waist-hip-ratio in addition to BMI be used in the assessment of adult Filipinos with overweight and obesity?**
Population	Adult Filipinos with overweight and obesity
Intervention	WC or WHR in addition to BMI
Comparison	BMI alone
Outcomes	**(a)** weight-related complications (DM, DLD, HTN, CVD and mortality, NAFLD/ NASH, OSA, etc.), **(b)** sarcopenia, **(c)** ACM, **(d)** QOL, **(e)** psychological outcomes (body image perceptions, depression score, anxiety disorder), **(f)** eating behaviors, **(g)** harm (of doing the test), **(h)** diagnostic accuracy (Sn, Sp, LRs)
Subgroups	**(a)** age (adults, older persons), **(b)** sex, **(c)** risk factor (DM, DLD, HTN, CVD and mortality)
Question 3	**Should we screen for hypothyroidism as an underlying cause using TSH among adult Filipinos with obesity?**
Population	Adult Filipinos with obesity
Intervention	Screening for hypothyroidism using TSH
Comparison	No screening
Outcomes	**(a)** hypothyroidism, myxedema coma, **(b)** DLD, **(c)** CVD and mortality, **(d)** ACM, **(e)** QOL, **(f)** obesity-related complications, **(g)** harm (of doing the test)
Subgroups	**(a)** age (adults, older persons), **(b)** family history of thyroid disorders, **(c)** presence or absence of CVD, **(d)** presence of other autoimmune diseases
Question 4	**Should we screen for polycystic ovarian syndrome among adult reproductive-aged Filipino women with obesity?**
Population	Adult reproductive-aged Filipino women with obesity
Intervention	Screening for PCOS using signs of androgen excess (e.g., hirsutism, androgenetic alopecia, acne) and menstrual irregularity
Comparison	No screening
Outcomes	**(a)** PCOS, **(b)** fertility, **(c)** improvement of hyperandrogenism (hirsutism, androgenetic alopecia, acne), **(d)** DM, **(e)** CV risk, **(f)** QOL, **(g)** harm (of doing the test)
Subgroups	None

Question 5	Should we screen for dysglycemia using a 75-gram oral glucose tolerance test among adult Filipinos with obesity?
Population	Adult Filipinos with obesity
Intervention	Screening for elevated blood glucose using 75gm OGTT
Comparison	No screening
Outcomes	**(a)** obesity-related complications (DM, DLD, HTN, CVD and mortality, NAFLD/ NASH, OSA, etc.), **(b)** ACM, **(c)** QOL, **(d)** harm (of doing the test), **(e)** diagnostic accuracy (Sn, Sp, LRs), **(f)** cost-effectiveness/cost utility
Subgroups	**(a)** age (adults, older persons), **(b)** sex, **(c)** BMI category, **(d)** presence of risk factors (DLD [high TG, low HDL], family history of first degree relative, history of macrosomia, etc.)
Question 6	**Should we screen for dyslipidemia using a fasting lipid profile among adult Filipinos with obesity?**
Population	Adult Filipinos with obesity
Intervention	Screening for dyslipidemia using a fasting lipid profile
Comparison	No screening
Outcomes	**(a)** obesity-related complications (DM, DLD, HTN, CVD and mortality, NAFLD/ NASH, OSA, etc.), **(b)** ACM, **(c)** QOL, **(d)** harm (of doing the test), **(e)** diagnostic accuracy (Sn, Sp, LRs), **(f)** cost-effectiveness/cost utility
Subgroups	**(a)** age (adults, older persons), **(b)** sex, **(c)** presence of risk factors (DG, smoking, etc.)
Question 7	**Should we screen for hypertension among adult Filipinos with obesity?**
Population	Adult Filipinos with obesity
Intervention	Screening for hypertension using any method
Comparison	No screening
Outcomes	**(a)** obesity-related complications (DM, dyslipidemia, HPN, CVD and mortality, NAFLD/NASH, OSA, etc.), **(b)** stroke, **(c)** ACM, **(d)** QOL, **(e)** diagnostic accuracy (Sn, Sp, LRs), **(f)** harm (of doing the test), **(g)** cost-effectiveness/cost utility
Subgroups	**(a)** age (adults, older persons), **(b)** sex, **(c)** presence of risk factors, **(d)** screening strategy/method (e.g., office BP)
Question 8	**Should we screen for non-alcoholic fatty liver disease/non-alcoholic steatohepatitis among adult Filipinos with obesity?**
Population	Adult Filipinos with obesity
Intervention	Screening for NAFLD/NASH using liver ultrasound and/or liver enzymes
Comparison	No screening
Outcomes	**(a)** liver cirrhosis, liver cancer, liver failure, **(b)** ACM, **(c)** QOL, **(d)** harm (of doing the test), **(e)** diagnostic accuracy (Sn, Sp, LRs), **(f)** cost-effectiveness/cost utility
Subgroups	**(a)** age (adults, older persons), **(b)** sex, **(c)** presence of risk factors (DM)

Question 9	Should we screen for obstructive sleep apnea using STOP-BANG score among adult Filipinos with obesity?
Population	Adult Filipinos with obesity
Intervention	Screening for OSA using STOP-BANG score
Comparison	No screening
Outcomes	**(a)** OSA, **(b)** obesity-related complications (DM, DLD, HTN, CVD, stroke), **(c)** ACM, **(d)** QOL, **(e)** harm (of doing the test), **(f)** diagnostic accuracy (Sn, Sp, LRs)
Subgroups	**(a)** age (adults, older persons), **(b)** sex, **(c)** BMI category, **(d)** blood pressure category
Question 10	**Should we screen for depression using the Patient Health Questionnaire-9 (PHQ9) tool among adult Filipinos with obesity?**
Population	Adult Filipinos with obesity
Intervention	Screening for depression using the PHQ-9 tool
Comparison	No screening
Outcomes	**(a)** depression, **(b)** ACM, **(c)** psychological outcomes (general well-being, body image perceptions, suicidal tendencies), **(d)** QOL, **(e)** improvement of eating behaviors, **(f)** harm (of doing the test), **(g)** diagnostic accuracy (Sn, Sp, LRs)
Subgroups	**(a)** age (adults, older persons), **(b)** sex, **(c)** BMI category
Question 11	**Should we screen for osteoarthritis among adult Filipinos with obesity?**
Population	Adult Filipinos with obesity
Intervention	Screening for osteoarthritis of weight bearing joints using symptom assessment and physical examination
Comparison	No screening
Outcomes	**(a)** OA, **(b)** pain score, **(c)** physical disability or physical function, **(d)** QOL
Subgroups	**(a)** age (adults, older persons), **(b)** sex
Question 12	**Should we screen for medications associated with weight gain among adult Filipinos with obesity?**
Population	Adult Filipinos with obesity
Intervention	Screening for use of medications (oral corticosteroids, antipsychotics, sulfonylureas, insulin, thiazolidinediones)
Comparison	No screening
Outcomes	**(a)** hypoglycemia, **(b)** ACM, **(c)** QOL, **(d)** psychological outcomes (general well-being; body image perceptions), **(e)** improvement of eating behaviors
Subgroups	None

ACM all-cause mortality; BMI body mass index; BP blood pressure; CV cardiovascular; CVD cardiovascular disease; DG dysglycemia; DLD dyslipidemia; DM diabetes mellitus; HDL high-density lipoprotein; HTN hypertension; LR likelihood ratio; NAFLD non-alcoholic fatty liver disease; NASH non-alcoholic steatohepatitis; OA osteoarthritis; OGTT oral glucose tolerance test; OSA obstructive sleep apnea; PHQ Patient Health Questionnaire; QOL quality of life; Sn sensitivity; Sp specificity; TG triglyceride; TSH thyroid-stimulating hormone; WC waist circumference; WHR waist-to-hip ratio; WHO World Health Organization

CPG Development Methodology

Guideline Preparation

- Composition of the CPG Task Force

The Obesity CPG Task Force was composed of several committees: the Steering Committee, the conflict of interest (COI) review committee, the Technical Working Group, and the Consensus Panel (Appendix 1).

The Steering Committee is composed of representatives from multiple disciplines such as medical nutrition, endocrinology, cardiology, and family and community medicine. The Committee oversaw the guideline development from the formulation and clarification of review questions to the finalization of the CPG manuscript. The Steering Committee was also responsible for selecting members of the Consensus Panel and the Technical Working Group as guided by the stipulations in the DOH manual for CPG development [18]. The COI review committee reviewed the COIs of the selected members of the Obesity CPG Task Force and recommended strategies to manage the COIs related to the questions of the CPG to limit the bias introduced by COIs (see section on Management of Conflict of Interest).

The Technical Working Group was composed of a technical coordinator, evidence review experts, a technical facilitator, and a technical writer. The technical coordinator and evidence review experts were responsible for reviewing the available evidence for each review question covered by the CPG. The technical facilitator presided over *en banc* meetings and facilitated discussions between the Consensus Panel, the Steering Committee, and the Technical Working Group. A technical writer was present throughout the process to synthesize the results of these discussions and to draft the CPG manuscript.

Subject matter experts and other key stakeholders (including policymakers, patient advocates, allied medical practitioners, and physicians from public, private, and occupational health settings) were invited to join the Consensus Panel, which was represented by a total of fourteen organizations. The Panel, through the *en banc* meetings, provided their insights on the evidence presented and finalized the recommendations per review question.

Evidence Synthesis

- Search Methods and Strategies

The evidence review experts conducted systematic searches of both local and international electronic databases (e.g., MEDLINE, The Cochrane Library and HERDIN). Text words and controlled vocabulary (e.g., MeSH) terms were used. The specific search strategy was dictated by the population, intervention, comparator, and outcome (PICO) specifications for each guideline question. See Appendix 2 for the final search strategies used for the evidence reviews.

- Inclusion and Exclusion Criteria

Existing systematic reviews with or without meta-analyses that matched the prespecified PICO were prioritized and evaluated for possible adaptation. For questions on screening, the evidence review experts searched for randomized trials of screening interventions that

reported outcomes on benefit and/or harm. In the absence of direct evidence, indirect evidence on test accuracy and effectiveness of early treatment were sought. Preference was given to randomized controlled trials (RCTs) while observational studies (e.g., cohort studies) were considered appropriate when RCTs were unavailable. For diagnostic test accuracy, observational studies with the appropriate index test and reference standard that reported diagnostic performance (e.g., sensitivity, specificity) or enough information to derive these (e.g., 2x2 table) were included.

- Study Quality Assessment

Two evidence review experts independently appraised the methodological quality of each study. Existing CPGs with recommendations that were relevant to the current guideline questions were assessed using the AGREE-II instrument. The evidence bases of high-quality CPGs (overall AGREE-II score ≥75%, AND scaled domain score ≥80% for "Rigour of Development") were adapted and updated. Primary studies were appraised using the Cochrane Risk of Bias tool for randomized trials, Newcastle-Ottawa Scale for cohort and case-control studies, QUADAS-2 for diagnostic test accuracy studies, or QUADAS-C for comparative test accuracy studies.

- Data Synthesis

Studies with sufficiently similar PICOs were pooled and the effect estimates were reported using RevMan 5.4. Measures of diagnostic performance (i.e., sensitivity, specificity) were pooled using STATA or R software. Heterogeneity was investigated using the Cochrane Q and I^2 statistics. When quantitative synthesis was not possible, the results were discussed qualitatively in the narrative.

The appraisal of included studies in the review for each research question and the synthesis of their effect estimates for critical and important outcomes were presented in an evidence summary. The balance of benefits and risks became the basis for the draft recommendations. The evidence summaries were compiled into an evidence base that was submitted before the *en banc* meetings to guide in the decision-making process of the multi-sectoral Consensus Panel.

Formulating Recommendations

- Certainty of Evidence and Strength of Recommendations

The GRADE approach was used to assess the certainty of evidence with the aid of GRADEPro, a web-based application that considers risk of bias, indirectness, imprecision, inconsistency, and other considerations (e.g., publication bias). The overall certainty of evidence was based on the lowest certainty rating among the top seven critical and important outcomes (Table 3). The rating of importance of outcomes into critical, important, or relevant was decided on by the multi-sectoral Consensus Panel.

Table 3. Basis for assessing the quality of the evidence using GRADE approach [19]

Certainty of Evidence	Interpretation
High	We are very confident that the true effect lies close to that of the estimate of the effect.
Moderate	We are moderately confident in the effect estimate. The true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different.
Low	Our confidence in the effect estimate is limited. The true effect may be substantially different from the estimate of the effect.
Very Low	We have very little confidence in the effect estimate. The true effect is likely to be substantially different from the estimate of effect.
Factors that lower quality of the evidence are: • Risk of bias • Important inconsistency of results • Some uncertainty about directness • High probability of reporting bias • Sparse data/Imprecision • Publication bias Additional factors that may increase quality are: • All plausible residual confounding, if present, would reduce the observed effect • Evidence of a dose-response gradient • Large effect	

- Patients' Views and Preferences

The evidence review experts searched for studies that tackled the patients' views and preferences on the intervention, including studies that described the impact of the intervention on equity, acceptability, and feasibility. The Consensus Panel was also encouraged to assess the intervention based on their experiences as key stakeholders, and to record their assessment on the acceptability equity, acceptability, and feasibility of the intervention in the Evidence-to-Decision (EtD) questionnaire.

- Resource Implications

The evidence review experts sought for evidence from cost-effectiveness studies on the resource implications associated with using the intervention. In the absence of cost-effectiveness studies, a summary of costs of the intervention offered in hospitals, laboratories, and pharmacies was included, if available.

- Rating of Outcomes

The Consensus Panel reviewed the evidence and the draft recommendations prepared by the Technical Working Group. Through an online survey, Panel members rated the relative importance of all outcomes for each research question in clinical decision-making. Each outcome was scored on a scale of 1–9 where outcomes scored from 1–3 were considered of limited importance, outcomes scored from 4–6 were important but not critical, and outcomes scored from 7–9 were considered critical.

- Consensus Process

Consensus Panel Meetings
Evidence summaries were compiled into sets of evidence summaries and were sent to the Consensus Panel prior to each *en banc* meeting. Panel members were oriented on the CPG process and how to interpret the evidence. After reviewing the evidence summaries, the Panel was also asked to fill out an EtD questionnaire as part of their assessment (Table 4).

Table 4. Detailed considerations based on the Evidence-to-Decision framework [20]

1. Is the problem a priority? 2. How accurate is the test? 3. How substantial are the desirable anticipated effects? 4. How substantial are the undesirable anticipated effects? 5. What is the certainty of the evidence of test accuracy? 6. Is there important uncertainty about or variability in how much people value the main outcomes, including adverse effects and burden of the test and downstream outcomes of clinical management guided by the test results? 7. Does the balance between desirable and undesirable effects favor the test or the comparison? 8. How large are the resource requirements (costs)? 9. What is the certainty of the evidence of resource requirements (costs)? 10. Does the cost-effectiveness of the test favor the test or the comparison? 11. What would be the impact on health equity? 12. Is the test acceptable to key stakeholders? 13. Is the test feasible to implement?

Five virtual *en banc* meetings were held via Zoom video conferencing and were moderated by an expert technical facilitator. The evidence review experts presented the key findings for their assigned guideline questions, after which the Consensus Panel was given opportunities to clarify the evidence presented and to explain the rationale behind their assessments in the EtD. A summary of their responses to the EtD questionnaire was presented to guide the panelists during their discussions.

Generation of recommendations
The Consensus Panel voted on the direction (i.e., for or against) and the strength (i.e., strong or weak) of the final recommendations based on the certainty of the evidence, the balance between benefits and harms, values, preferences, and burden on patients, cost and resource implications, equity, acceptability, and feasibility. Consensus was achieved when 75% of the voting Panel members agreed on the proposed recommendation or decision. A modified Delphi process was implemented when no consensus was reached after three rounds of nominal voting.

A standardized language was used in the wording of each recommendation. “For” was used if it was a positive recommendation for screening, and “against” was used if the recommendation was negative. Weak recommendations were worded as suggestions (i.e., “We suggest”), and strong recommendations began with “We recommend”. For each guideline question and recommendation, consensus issues or the narrative of the comments and feedback of the Consensus Panel were recorded by the technical writer for inclusion in the final manuscript.

External Review

The CPG manuscript was externally reviewed by a clinical epidemiologist and methodology expert, a content expert clinician, and a non-content expert clinician using a modified AGREE-REX tool. Feedback from the external reviewers was considered by the Steering Committee and the technical coordinator prior to finalizing this manuscript.

Editorial Independence

- ## Funding Source

The CPG development was funded by the DOH and managed by the University of the Philippines Manila National Institutes of Health.

- ## Management of Conflicts of Interest

All Task Force members submitted the following documents before initiating the guideline development process: a declaration of their COIs using the prescribed DOH form and the latest version of their curriculum vitae. The declaration covered their personal, potential, intellectual, and/or financial COI within the previous 4 years (Appendix 3). These documents were then reviewed by an independent COI Review Committee to determine the presence of any significant COIs and to recommend strategies to manage these. These strategies included broadcasting their COIs during Consensus Panel meetings (Status B), disallowing them from voting on certain questions (Status C), disallowing their participation in specific guideline questions (Status D, evidence review experts), and prohibition from participating in any part of the CPG (Status D, Steering Committee member, technical coordinator, or technical facilitator).

Recommendation and Evidence Summaries

Should we use the Asia-Pacific cut-off for BMI instead of WHO values to diagnose overweight and obesity among adult Filipinos?

Among adult Filipinos, we recommend the use of the Asia-Pacific criteria rather than the World Health Organization global criteria for body mass index to diagnose overweight and obesity. (Very low certainty of evidence, Strong recommendation)

NOTE: Asia-Pacific BMI cut-offs: ≥23.0 kg/m^2 (overweight), ≥25.0 kg/m^2 (obese)

CONSENSUS ISSUES

The Consensus Panel recognizes the potential for mislabeling individuals as having overweight or obesity when using lower BMI cut-offs such as those specified under the WHO Asia-Pacific (WHO-APP) criteria. However, despite the very low certainty of evidence, the panelists decided on a strong recommendation because of the following considerations:

- There are low undesirable effects with using the WHO-APP BMI criteria.
- Early diagnosis of overweight or obesity provides opportunities to implement interventions to prevent the development of cardiometabolic conditions. Clinicians and healthcare providers must communicate the value of early interventions to improve future health outcomes.

KEY FINDINGS

Two observational studies done among adult Filipino populations in Canada and USA investigated the association between the WHO-APP BMI thresholds for overweight and obesity and certain cardiometabolic diseases (hypertension and diabetes mellitus). A diagnosis of obesity using lower BMI cut-offs was associated an increased likelihood of developing at least one cardiometabolic condition (OR 2.39 [95% CI 1.27, 4.47]). The diagnosis of overweight and obesity using the WHO-APP cut-off was associated with the development of hypertension (OR 2.63 [95% CI 1.52, 4.50] and 3.02 [95% CI 1.97, 4.61], respectively). Similarly, obesity is also a prognostic factor for having diabetes (OR 2.96 [95% CI 1.53, 4.50]). The overall certainty of evidence was downgraded to very low due to serious risk of bias, serious imprecision, and serious indirectness.

BURDEN OF DISEASE

Overweight and obesity are characterized by an abnormal accumulation of adiposity in the body, leading to an increased risk for many noncommunicable diseases. As of 2019, a local survey by the Food and Nutrition Research Institute showed that approximately 27 million Filipinos were overweight or obese [4]. The prevalence of overweight and obesity among adults increased twofold from 20.2% in 1998 to 36.6% in 2019.

An individual can be classified as having overweight or obesity based on their BMI, which is the ratio between body weight in kilograms (kg) and height in squared meters (m^2). A classification based on European populations has been developed, but it has been recommended that Asian Pacific populations use lower cut-offs due to increased risk for non-communicable diseases (i.e., WHO-APP) [5] (Table 5).

Table 5. WHO and WHO-APP body mass index classification systems [5]

BMI Classification	WHO Cut-offs (kg/m^2)	WHO-APP Cut-offs (kg/m^2)
Underweight	<18.5 kg/m^2	<18.5 kg/m^2
Normal	18.5–24.9 kg/m^2	18.5–22.9 kg/m^2
Overweight	25–29.9 kg/m^2	23–24.9 kg/m^2
Obesity	≥30 kg/m^2	≥25 kg/m^2

BMI body mass index, WHO World Health Organization, WHO-APP World Health Organization Asia-Pacific population

PROGNOSTIC PERFORMANCE

Observational studies conducted in Canada (n=18,794) and the USA (n=382) among Filipino participants were included in this review (Table 6). The studies utilized different cut-off values for BMI, but both sets of cut-offs were lower than the standard BMI cut-offs of WHO based on European populations.

The risk of having at least one cardiometabolic condition (i.e., diabetes mellitus, hypertension, or CVD) was twice as high among Filipino-Canadian participants of the increased risk group (BMI 23–27.5 kg/m^2) compared to the acceptable risk group (BMI 18.5–23 kg/m^2; OR 2.12 [95% CI 0.98, 4.58]) [21]. The high-risk group (BMI ≥27.5 kg/m^2) also had an increased likelihood of developing cardiometabolic disease (OR 2.39 [95% CI 1.27, 4.47]).

There was no significant difference in the odds of having diabetes among Filipino-American women who were classified as overweight and those with normal BMI based on the WHO-APP cut-offs [22]. Patients with BMI ≥25 kg/m^2, who were classified as obese based on the WHO-APP cut-offs, had greater odds for diabetes mellitus, indicating a strong association with obesity (OR 2.96 [95% CI 1.53, 4.5]). Women classified as overweight also had increased odds of having hypertension (OR 2.63 [95% CI 1.52, 4.5]), while those classified as obese had even greater increase in odds (OR 3.02 [95% CI 1.97, 4.61]) [22]. Both cut-offs showed strong association with the development of hypertension.

The overall certainty of evidence was downgraded to very low due to serious risk of bias (lack of follow-up, which is necessary in assessment of evidence on prognosis), serious imprecision (some confidence intervals crossed the null value), and serious indirectness (from the recruitment of immigrant Filipino populations living in North America, who may have significantly varied dietary and lifestyle practices compared to Filipinos living in the Philippines).

Table 6. Development of cardiometabolic diseases in Filipinos with overweight/obesity diagnosed with lower body mass index cut-offs

Outcomes	No. of studies (No. of participants)	Cut-offs (kg/m^2)	Comparator (kg/m^2)	OR [95% CI]	Certainty of Evidence
≥1 cardiometabolic condition: HTN, DM or heart disease	1 XS (n=18,794) [21]	23–<27.5[a]	18.5–23	2.12 [0.98, 4.58]	Very low
		≥27.5[b]	18.5–23	2.39 [1.27, 4.47]	
DM	1 XS (n=382) [22]	23.1–24.9[c]	≤23	1.84 [0.95, 3.52]	Very low
		≥25[d]	<25	2.96 [1.53, 4.50]	
HTN	1 XS (n=382) [22]	23.1–24.9[c]	≤23	2.63 [1.52, 4.50]	Low
		≥25[d]	<25	3.02 [1.97, 4.61]	

CI confidence interval; DM diabetes mellitus; HTN hypertension; OR odds ratio, XS cross-sectional study
[a] increased risk
[b] high risk
[c] overweight
[d] obese

COST IMPLICATION

Obtaining BMI requires very minimal cost and resources since the necessary instruments for measuring anthropometrics (weighing scale and measuring tape) are readily available in clinics or health centers.

EQUITY, ACCEPTABILITY, AND FEASIBILITY

There are currently no local studies on patients' values and preferences, equity, acceptability, and feasibility of the use of WHO-APP BMI cut-offs among Filipinos.

RECOMMENDATIONS FROM OTHER GROUPS

Table 7. Recommendations from other guidelines, organizations, or societies on the assessment of overweight/obesity using body mass index

Group (Year)	Recommendation	Strength of Recommendation/ Certainty of Evidence
PHEX (2021) [23]	We recommend the use of behavioral counselling or psychological/ motivational coaching for healthy nutrition to promote weight loss, prevent hypertension, and prevent diabetes among Filipino adults without CV risk factors.	Strong Recommendation Low certainty of evidence
	We recommend the use of brief interventions, psychological/ motivational coaching, or behavioral counselling for physical activity to prevent hypertension, diabetes, and obesity, to promote weight loss, and to increase physical activity among Filipino adults without CV risk factors	Strong Recommendation Low certainty of evidence
	No recommendation on whether to use the WHO or WHO-APP BMI criteria in screening for or diagnosing obesity among Filipino/Asia-Pacific adults.	

Group (Year)	Recommendation	Strength of Recommendation/ Certainty of Evidence
NICE (2022) [24]	No recommendation on whether to use the WHO or WHO-APP BMI criteria in screening for or diagnosing obesity among Filipino/Asia-Pacific adults.	N/A
ESE (2020) [10]	We suggest that for all patients it is of value to measure weight and height to calculate BMI, as obesity is an important condition that often remains undiagnosed. For routine care defining obesity as BMI >30 kg/m^2 is sufficient as first diagnostic measure. Measuring waist-circumference can provide additional information especially if BMI <30 kg/m^2. No recommendation on whether to use the WHO or WHO-APP BMI criteria in screening for or diagnosing obesity among Filipino/Asia-Pacific adults.	N/A
CMA (2020) [25]	Health care providers can measure height, weight and calculate the BMI in all adults, and measure waist circumference in individuals with a BMI 25–35 kg/m^2 No recommendation on whether to use the WHO or WHO-APP BMI criteria in screening for or diagnosing obesity among Filipino/Asia-Pacific adults.	Level 2a, Grade B[a]
AACE/ACE (2016) [13]	All adults should be screened annually using a BMI measurement; in most populations a cutoff point of ≥25 kg/m^2 should be used to initiate further evaluation of overweight or obesity. No recommendation on whether to use the WHO or WHO-APP BMI criteria in screening for or diagnosing obesity among Filipino/Asia-Pacific adults.	GRADE A, BEL 2[b]
AHA/ACC, The Obesity Society (2013) [26]	Use the current cutpoints for overweight (BMI 25.0–29.9 kg/ m^2) and obesity (BMI ≥30 kg/ m^2) to identify adults who may be at elevated risk of CVD and the current cutpoints for obesity (BMI ≥30 kg/ m^2) to identify adults who may be at elevated risk of mortality from all causes. No recommendation on whether to use the WHO or WHO-APP BMI criteria in screening for or diagnosing obesity among Filipino/Asia-Pacific adults.	NHLBI Grade 2 (Strong), ACC/AHA COR I, ACC/AHA LOE B[c]

AACE American Association of Clinical Endocrinologists; ACC American College of Cardiology; ACE American College of Endocrinology; AHA American Heart Association; BMI body mass index; CMA Canadian Medical Association; CPG clinical practice guideline; CV cardiovascular; CVD cardiovascular disease; ESE European Society of Endocrinology; NHLBI National Heart, Lung, and Blood Institute; NICE National Institute for Health and Care Excellence; NIH National Institutes of Health; PHEx Philippine Guidelines on Periodic Health Examination; WHO World Health Organization; WHO-APP World Health Organization Asia-Pacific population

[a] Level 2b: evidence from at least 1 controlled study without randomization; Grade B: directly based on level 2 evidence or extrapolated recommendation from category 1 evidence; use the terms “may” or “can”

[b] GRADE A: strong; Best Level of Evidence (BEL) 2: intermediate

[c] NHLBI A: Strong, there is high certainty based on evidence that the net benefit is substantial; ACC/AHA Class of Recommendation (COR) I: procedure/treatment SHOULD be performed/administered; ACC/AHA Level of Evidence (LOE) B: limited populations evaluated, data derived from a single randomized trial or nonrandomized studies

Should waist circumference or waist-to-hip ratio in addition to body mass index be used in the assessment of adult Filipinos with overweight and obesity?

Among adult Filipinos, we <u>suggest the use</u> of waist circumference and waist-to-hip ratio in addition to body mass index to diagnose obesity. (Very low certainty of evidence, Weak recommendation)

NOTE:

- *Waist circumference cut-offs (obese): ≥90 cm (male), ≥80 cm (female)*
- *Waist-to-hip ratio cut-offs (obese): ≥1.0 (male), ≥0.85 (female)*

CONSENSUS ISSUES

The Consensus Panel acknowledges the value of using waist circumference and waist-to-hip ratio (WHR) in addition to BMI in diagnosing obesity. Having more parameters could better support a diagnosis of nutritional status. BMI alone may also not accurately diagnose obesity since it considers total body weight and not just adiposity. Patients may be amenable to having their waist circumference and WHR measurements taken, and they may already be aware of the value of and how to take these measurements. Incorporating waist circumference and WHR in obesity diagnosis may alsobroaden the perspective on diagnosing and treating obesity.

However, the Panel specifies the following considerations:

- Healthcare practitioners may consider a patient's age, lifestyle, and physical activity when deciding on using these measurements as criteria for diagnosing obesity. Individuals who engage in resistance training may benefit from these measurements since they may have high muscle mass but low adiposity, which BMI will not be able to discriminate.
- The accuracy of waist circumference and WHR measurements relies on the placement of the measuring tape when taking these measurements (Appendix 4). Training is needed to ensure that healthcare practitioners can take accurate measurements.
- Taking waist circumference and WHR measurements may introduce slight inconvenience or discomfort to patients.

KEY FINDINGS

There was no direct evidence on the use of waist circumference or WHR to screen for obesity in Filipino adults. The included cross-sectional study (n=332) compared the diagnostic utility of waist circumference, WHR and BMI in predicting risk for diabetes, dyslipidemia, and hypertension among adult Filipinos. WHR best predicted the occurrence of diabetes, and waist circumference best predicted the presence of hypertension. Although dyslipidemia was predicted best by BMI among males, no index test was useful for detecting the condition among females. Waist circumference, WHR and BMI all had moderate sensitivity and specificity in predicting diabetes, hypertension, and dyslipidemia. However, the overall certainty of evidence is low due to indirectness, risk of bias from concerns regarding patient selection, and imprecision.

BURDEN OF DISEASE

Central or abdominal obesity is a CVD risk factor independent of BMI, and it can be assessed using waist circumference and WHR, which is the ratio of waist circumference and hip circumference (the maximum circumference [in cm] around the buttocks posteriorly and pubic symphysis anteriorly). These anthropometric measurements can also be used as screening tools to estimate weight status in relation to possible risk of disease. Studies have shown that a higher waist circumference also leads to an increased risk for heart disease, diabetes, hypertension, dyslipidemia, non-alcoholic fatty liver disease (NAFLD) and mortality. Cut-offs for these measurements may also vary between populations (Table 8). To date, there are no validated cut-offs for waist circumference and WHR for adult Filipinos to diagnose obesity [27,28].

Table 8. WHO and WHO-APP waist circumference and waist-to-hip ratio cut-offs for obesity [5]

	WHO Cut-offs (kg/m^2)		**WHO-APP Cut-offs** (kg/m^2)	
Sex	**WC**	**WHR**	**WC**	**WHR**
Male	≥102 cm	≥1.0	≥90 cm	≥1.0
Female	≥88 cm	≥0.85	≥80 cm	≥0.85

DIAGNOSTIC PERFORMANCE

A local cross-sectional study that assessed the ability of three index tests to predict diabetes, hypertension, and dyslipidemia among Filipino adults (n=332) without known cardiometabolic diseases from a rural community was included in the review.

Diabetes was predicted best by WHR (males: AUC 0.67, females: AUC 0.70) and worst by BMI (males: AUC 0.53, females: AUC 0.55) [29] (Table 9). The presence of hypertension was best predicted by waist circumference and BMI (AUC 0.75 and 0.74, respectively) in males, and by waist circumference and WHR (AUC 0.59 and 0.58, respectively) in females. On the other hand, BMI predicted the occurrence of dyslipidemia the best among males (AUC 0.59), while none of the tests were useful for detecting dyslipidemia in females.

Table 9. Comparison of predictive performance of waist circumference, waist-to-hip ratio, and body mass index in predicting cardiometabolic conditions [29]

		AUC [95% CI][a]		
Outcome	**Sex**	**WC**	**WHR**	**BMI**
DM	Male	0.57 [0.38, 0.76]	0.67 [0.51, 0.83]	0.53 [0.33, 0.73]
	Female	0.63 [0.51, 0.75]	0.70 [0.59, 0.82]	0.55 [0.43, 0.67]
HTN	Male	0.75 [0.65, 0.85]	0.72 [0.62, 0.83]	0.74 [0.63, 0.84]
	Female	0.59 [0.51, 0.67]	0.58 [0.50, 0.67]	0.56 [0.48, 0.65]
DLD	Male	0.51 [0.37, 0.66]	0.46 [0.33, 0.60]	0.59 [0.43, 0.73]
	Female	0.45 [0.36, 0.54]	0.46 [0.37, 0.54]	0.50 [0.41, 0.59]

AUC area under the curve; BMI body mass index; CI confidence interval; DLD dyslipidemia; DM diabetes mellitus; HTN hypertension; WC waist circumference; WHR waist-to-hip ratio

[a] values closer to 1= better predictive performance; values closer to 0.5=useless test

The index tests achieved moderate sensitivity and moderate specificity in predicting diabetes [29] (Table 10). A high WHR increased the odds of diabetes by 50%, while a normal WHR decreased the odds by 35%. High waist circumference was found to raise the odds of diabetes by 37%, whereas a normal waist circumference lowered the odds by 24%. Lastly, having a BMI of ≥23 lead to greater odds of diabetes by 13%, while a normal BMI had lowered odds by 14%.

In predicting hypertension, the three index tests demonstrated moderate sensitivity and moderate specificity [29] (Table 10). A high waist circumference increased the odds of hypertension by 28%, and a normal waist circumference led to lowering the odds by 17%. Higher WHR lead to higher odds of hypertension by 16%, while a normal WHR reduced the odds by 11%. A high BMI resulted in raised odds of hypertension by 25%, while a normal BMI decreased the odds by 22%.

The index tests also had moderate sensitivity and moderate specificity in the prediction of dyslipidemia [29] (Table 10). Having a high waist circumference was shown to lower the odds of dyslipidemia by 11%, whereas a normal waist circumference increased the odds by 9%. The odds of dyslipidemia decreased by 11% when WHR was high, but the odds increased by 11% when WHR was normal. Finally, having a high BMI raised the odds of dyslipidemia by 10%, but the odds decreased by 9% when BMI was normal.

The certainty of evidence was downgraded due to risk of bias and to imprecision because of the wide confidence intervals. The included study had a moderate risk of bias due to possible selection bias (healthy volunteer effect). The QUADAS-2 and QUADAS-C tools were used in the assessment, with noted high risk of bias in the domain of patient selection.

Table 10. Comparison of sensitivity and specificity of waist circumference, waist-to-hip ratio, and body mass index in predicting cardiometabolic conditions [29]

Outcome	Index test	No. of Studies (No. of Participants)	Estimate [95% CI]	LR	Certainty of Evidence
DM[a]	WC[d]	1 XS (n=37)	Sn 54% [37, 71]	(+): 1.37 (-): 0.76	Low
		1 XS (n=295)	Sp 61% [55, 66]		Moderate
	WHR[e]	1 XS (n=37)	Sn 62% [45, 78]	(+): 1.50 (-): 0.65	Low
		1 XS (n=295)	Sp 59% [53, 64]		Moderate
	BMI[f]	1 XS (n=37)	Sn 57% [39, 73]	(+): 1.13 (-): 0.86	Low
		1 XS (n=295)	Sp 50% [44, 56]		Moderate
HTN[b]	WC[d]	1 XS (n=95)	Sn 48% [39, 58]	(+): 1.28 (-): 0.83	Low
		1 XS (n=237)	Sp 62% [56, 68]		Moderate
	WHR[e]	1 XS (n=95)	Sn 48% [39, 58]	(+): 1.16 (-): 0.89	Low
		1 XS (n=237)	Sp 58% [52, 64]		Moderate
	BMI[f]	1 XS (n=95)	Sn 59% [49, 68]	(+): 1.25 (-) 0.78	Moderate
		1 XS (n=237)	Sp 53% [46, 59]		Moderate
DLD[c]	WC[d]	1 XS (n=259)	Sn 40% [34, 46]	(+): 0.89 (-): 1.09	Low
		1 XS (n=73)	Sp 55% [43, 66]		Moderate
	WHR[e]	1 XS (n=259)	Sn 43% [36, 49]	(+): 0.89 (-): 1.11	Low
		1 XS (n=73)	Sp 52% [40, 64]		Moderate
	BMI[f]	1 XS (n=259)	Sn 51% [45, 58]	(+): 1.10 (-): 0.91	Moderate
		1 XS (n=73)	Sp 53% [41, 65]		Moderate

BMI body mass index; CI confidence interval; DLD dyslipidemia; DM diabetes mellitus; HTN hypertension; LR likelihood ratio; Sn sensitivity; Sp specificity; WC waist circumference; WHR waist-to-hip ratio; XS cross-sectional study

[a] reference standard used: fasting plasma glucose or 2-hour 75-g oral glucose tolerance test

[b] reference standard used: JNC-7

[c] reference standard used: NCEP ATP III criteria

[d] based on WHO-APP cut-off values: ≥90 cm for males and ≥80 cm for females

[e] criteria for diagnosis: ≥1.0 in males and ≥0.85 in females

[f] based on WHO-APP cut-off values: 23.0 to 24.9 kg/m^2 for overweight and ≥25 kg/m^2 for obesity

COST IMPLICATION

There were no local cost-effectiveness studies found on the use of waist circumference or WHR in screening for obesity, but the overall estimated cost of screening using these index tests is expected to be low. Treatment for obesity includes lifestyle interventions (e.g., low caloric diet, reduced dietary fat and carbohydrates, increased physical activity), pharmacologic therapy with orlistat (up to 3 times/day for PHP 100.00–150.00)* [30], or bariatric surgery (≥PHP 80,000.00)* [31] in extreme cases with metabolic complications.

*Costs as of the writing of this CPG

EQUITY, ACCEPTABILITY, AND FEASIBILITY

Despite the established risks for cardiometabolic diseases associated with obesity, there are still high rates of nonadherence to lifestyle and behavior modification [30]. Some barriers to lifestyle modification include poor motivation, lack of time, environmental, societal, and social pressures, health and physical limitations, negative thoughts/moods, socioeconomic constraints, and lack of enjoyment of exercise [32]. In the Philippines, there is also a lack of trained professionals to administer behavioral therapy [30]. Meanwhile, the predictors of adherence to lifestyle modification included early weight loss success, lower BMI, better baseline mood, being male and older age [32].

A local study by De Roxas [33] assessed the experiences of six adult Filipinos regarding obesity via interviews. The study showed that obesity had negative consequences on the subjects physically and socially, but that the subjects had adaptive coping mechanisms to obesity. The study concluded that “the physical, the psychological and social consequences of obesity experienced by Filipinos called for a need of a special psychological intervention” [33]. However, the full copy of the paper could not be retrieved and was not available for full review.

RECOMMENDATIONS FROM OTHER GROUPS

Table 11. Recommendations from other guidelines, organizations, or societies on the assessment of overweight/obesity using waist circumference and waist-to-hip ratio

Group (Year)	Recommendation	Strength of Recommendation/ Certainty of Evidence
ACC/AHA (2013) [26]	Measure WC at annual visits or more frequently in overweight and obese adults Advise adults that the greater the WC, the greater the risk of CVD, type 2 diabetes, and all-cause mortality. The cut-points currently in common use (from either NIH/NHLBI or WHO/IDF) may continue to be used to identify patients who may be at increased risk until further evidence becomes available.	Expert Opinion

Group (Year)	Recommendation	Strength of Recommendation/ Certainty of Evidence
USPSTF (2012) [34]	The USPSTF recommends screening all adults for obesity. Screening tests: BMI is calculated from the measured weight and height of an individual. Recent evidence suggests that WC may be an acceptable alternative to BMI measurement in some patient populations. No evidence was found about appropriate intervals for screening.	B
Canadian CPG (2006) [35]	We recommend measuring WC in all adults to assess obesity-related health risks.	Grade A, Level 3
NIH, NHLBI, and American Association for the Study of Obesity (2000) [36]	Assessment of a patient should include the evaluation of BMI, WC and overall medical risk. […] It is not necessary to measure WC in individuals with BMI ≥35 kg/m^2 since it adds little to the predictive power of the disease risk classification.	—
AACE/ACE (2016) [13]	When evaluating patients for adiposity-related disease risk, WC be measured in all patients with BMI < 35 kg/m^2	A
	Region and ethnic specific cut-off point values for WC should be used as measures of abdominal adiposity and disease risk	B
UP-PGH Family Medicine Research Group (2002) [30]	WC could also be an adjunctive measure to define obesity. A WC of >102 cm for males and >88cm for females would also warrant a diagnosis of obesity	C
	The following information should be included in the physical examination report: height, weight, WC and blood pressure	B

AACE American Association of Clinical Endocrinologists; ACC American College of Cardiology; ACE American College of Endocrinology; AHA American Heart Association; BMI body mass index; CPG clinical practice guideline; CVD cardiovascular disease; NHLBI National Heart, Lung, and Blood Institute; NIH National Institutes of Health; UP-PGH University of the Philippines-Philippine General Hospital; USPSTF US Preventive Services Task Force; WC waist circumference

Should we screen for hypothyroidism as an underlying cause using TSH among adult Filipinos with obesity?

Among adult Filipinos, we suggest screening for hypothyroidism using thyroid-stimulating hormone among adults aged ≤70 years old at the initial visit. (Very low certainty of evidence, Weak recommendation)

CONSENSUS ISSUES

The Consensus Panel acknowledges that screening for hypothyroidism using thyroid-stimulating hormone (TSH) measurements may be acceptable to patients since it is easy to perform, would not require much preparation on the part of the patient, and results in minimal harmful effects on the individual. However, a weak recommendation was given due to the following considerations:

- Aside from obesity, there are other clinical signs and symptoms that may be used in assessing the likelihood of having hypothyroidism.
- Screening may encourage treatment for subclinical hypothyroidism. However, there was no conclusive evidence on the benefits of early treatment.
- Other blood tests (e.g., cardiometabolic assessments) should be prioritized.

KEY FINDINGS

There is no direct evidence on the effectiveness of screening for hypothyroidism among adults with obesity. An RCT on screening with TSH and free thyroxine (FT4) among pregnant women (n=135; mean age 41.2 [SD 5.3] years old) found no significant difference in change in BMI, high-density lipoprotein (HDL) cholesterol and triglycerides compared to no screening. In another six RCTs among pregnant women with hypothyroidism (n=2,531), levothyroxine treatment was found to reduce the likelihood of pregnancy losses. Levothyroxine treatment also decreased the likelihood of CV events in younger patients with subclinical hypothyroidism, but not among older patients with the same condition (n=7,778). The occurrence of any serious adverse events (SAEs) was not significantly associated with levothyroxine treatment among elderly adults with subclinical hypothyroidism. There was no significant difference in the risk of new-onset atrial fibrillation and fracture. The overall certainty of evidence was very low due to indirectness in population, imprecision, and reliance on observational studies.

BURDEN OF DISEASE

Hypothyroidism is one of the most common endocrine abnormalities, and it is associated with dyslipidemia, hypertension, atherosclerosis, and increased CV events [37]. Symptoms of hypothyroidism are typically vague, often difficult to recognize, and can be easily confused with those of obesity [10]. Moreover, the co-existence of obesity and hypothyroidism is common. A recent meta-analysis estimated that the prevalence of hypothyroidism among persons with obesity was 14.0% (95% CI 9.7, 18.9) [38]. Locally, the PHILTIDES study revealed that the prevalence of overt hypothyroidism and subclinical hypothyroidism in the general population is 0.41% and 2.18%, respectively [39]. Because hypothyroidism is considered a secondary cause of obesity [40], higher estimates are likely present among this specific population.

TSH is the best screening test for thyroid dysfunction for most clinical situations, such that normal TSH is enough to rule out primary hypothyroidism [41]. Primary hypothyroidism is presently defined as TSH concentrations above the reference range and FT4 concentrations below the reference range. Mild or subclinical hypothyroidism, which is commonly regarded as a sign of early thyroid failure, is defined by TSH concentrations above the reference range and FT4 concentrations within the normal range [42].

Given the high prevalence of hypothyroidism among individuals with obesity, several international guidelines recommend that all patients with obesity should be considered for thyroid hormone level testing [30,43–46]. However, there is still paucity of high-quality prospective studies to support the benefit of screening. Treatment of hypothyroidism as a secondary cause of obesity is postulated to improve weight by raising the basal metabolic rate and reducing water retention [47]. Improvement of weight and lipid parameters can potentially improve CV outcomes even among patients with obesity who are even at a higher risk [48].

BENEFITS AND HARMS

An RCT found that hypothyroidism screening with TSH and FT4 in pregnant women resulted in a greater reduction in BMI compared to no screening, but this was not statistically significant [49] (Table 12). Change in HDL cholesterol (MD 0 mmol/L [95% CI -0.335, 0.335]) and triglyceride levels (MD 0.21 mmol/L [95% CI -0.35, 0.1]) was similar in both groups.

Indirect evidence from trials on pregnant adults with hypothyroidism showed that treatment with levothyroxine reduced the risk of pregnancy loss (OR 0.34 [95% CI 0.23, 0.52]) [50] (Table 12). Levothyroxine treatment in patients with subclinical hypothyroidism was associated with a lower risk of CV events among younger patients (≤70 years old) but not in older patients (≥65 years old) (OR 0.61 [95% CI 0.39, 0.95] and OR 1.13 [95% CI 0.96, 1.34], respectively) [51,52]. The occurrence of any SAEs was not significantly associated with levothyroxine treatment among elderly adults with subclinical hypothyroidism. There was no significant difference in the risk of new-onset atrial fibrillation and [53].

The overall certainty of evidence is very low. The certainty of evidence was downgraded due to indirectness in population (non-obese and/or pregnant adults) and imprecision.

Table 12. Efficacy of screening with TSH and FT4 and of treatment with levothyroxine for hyperthyroidism

Outcomes (Duration of follow-up)	No. of Studies (No. of Participants)	Effect Estimate [95% CI]	Interpretation	Certainty of Evidence
Screening for hyperthyroidism vs. no screening among pregnant adults				
BMI in kg/m^2 (mean 9 yrs)	1 RCT (n=135) [49]	MD -2.5 [-4.00, 0.30]	Inconclusive	Very low
HDL in mmol/L (mean 9 yrs)	1 RCT (n=135) [49]	MD 0 [-0.34, 0.34]	Equivalent	Very low
TG in mmol/L (mean 9 yrs)	1 RCT (n=135) [49]	MD -0.2 [-0.35, 0.10]	Equivalent	Very low
Treatment with levothyroxine vs. no treatment among adults with hypothyroidism				
Pregnancy loss (0–9 mos)	6 RCTs (n=2,531) [50]	OR 0.34 [0.23, 0.52]	Beneficial	Moderate
CVD (1–5 yrs): Elderly subgroup (≥65 years old)	5 OS (n=4,685) [51]	OR 1.13 [0.96, 1.34]	As good as or worse	Very low
CVD (1–5 yrs): Younger subgroup (≤70 years old)	1 OS (n=3,093) [54]	OR 0.61 [0.39, 0.95]	Beneficial	Very low

BMI body mass index; CI confidence interval; CVD cardiovascular disease; HDL high-density lipoprotein; MD mean difference; OR odds ratio; OS observational study; RCT randomized controlled trial; TG triglyceride

COST IMPLICATION

There is no available local cost-effectiveness study on screening for hypothyroidism. The cost of TSH testing among diagnostic centers ranged from PHP 500.00–825.00*. Treatment for hypothyroidism, i.e., 100 mcg/tab levothyroxine where the usual maintenance dose computed at 1.6 mcg/kg body weight, cost from PHP 10.00–18.50 per tablet*, depending on the brand.

*Cost as of the writing of this CPG

EQUITY, ACCEPTABILITY, AND FEASIBILITY

No studies reporting on asymptomatic adults' preferences and values concerning screening for hypothyroidism were found.

RECOMMENDATIONS FROM OTHER GROUPS

Table 13. Recommendations from other guidelines, organizations, or societies on the assessment of hypothyroidism

Group (Year)	Recommendation	Strength of Recommendation/ Certainty of Evidence
ESE (2020) [10]	Recommended that all patients with obesity should be tested for thyroid function. Recommend that testing for hypothyroidism is based on TSH.	(+++0) Moderate
Singapore MOH (2011) [43]	Patients should be evaluated for secondary causes of obesity, such as medications (including "traditional" medicine which contains corticosteroids, antipsychotics, and antidepressants), and genetic or endocrine disorders (Cushing's syndrome, hypothyroidism).	N/A

Group (Year)	Recommendation	Strength of Recommendation/ Certainty of Evidence
Cipto Mangunkusumo Hospital (2011) [44]	Patients should be asked if with for signs and symptoms of hypothyroidism and be evaluated and treated accordingly.	N/A
MASO/MEMS (2004) [45]	Obesity in adults can be diagnosed by performing a comprehensive medical evaluation, which includes the patient's family history, physical examination, and laboratory tests. If indicated, thyroid function should be checked.	N/A
UP-PGH Family Medicine Research Group (2002) [30]	Patients should be asked if with for signs and symptoms of hypothyroidism and be evaluated and treated accordingly.	N/A
MSEM (2011) [46]	The following tests may also be requested depending on any suspected or identified comorbid conditions or secondary causes of obesity: Free T4 and TSH, if hypothyroidism is suspected	N/A

ESE European Society of Endocrinology; MASO Malaysian Association for the Study of Obesity; MEMS Malaysian Endocrine and Metabolic Society; MOH Ministry of Health; MSEM Myanmar Society of Endocrinology and Metabolism; UP-PGH University of the Philippines – Philippine General Hospital

Should we screen for polycystic ovary syndrome among reproductive-aged Filipino adult women with obesity?

Among adult reproductive-aged Filipino women with obesity, we <u>recommend screening</u> for polycystic ovarian syndrome using the Rotterdam criteria at the initial visit. (Low certainty of evidence, Strong recommendation)

CONSENSUS ISSUES

Despite the low certainty of evidence, a strong recommendation was given to screen for PCOS based on the following considerations:

- There is no substantial evidence on the prevalence of PCOS among persons with obesity and vice versa. However, based on clinical experience, PCOS is one of the top consultations received by obstetricians and gynecologists and these patients were often with obesity.
- Patients would greatly benefit from early detection and early treatment for PCOS since it is a lifelong condition that is often diagnosed late.
- Although not covered in the review, lifestyle changes are first considered for treatment of PCOS due to their effectiveness across various health outcomes.

The Consensus Panel also acknowledges the following:

- While obesity is common among patients with PCOS, it is not a risk factor that would trigger the assessment of PCOS.
- Increasing awareness at an earlier reproductive age may also facilitate early detection of PCOS.

KEY FINDINGS

There was no direct evidence investigating the effectiveness of screening compared to no screening for PCOS among reproductive-aged Filipino adult women with obesity. RCTs on the treatment of PCOS among reproductive-aged adults with obesity found that the use of metformin compared to placebo significantly increased pregnancy rates (RR 1.62 [95% CI 1.16, 2.25]) and reduced fasting blood sugar (FBS) (MD -4.44 mg/dL [95% CI -7.00, -1.88]). Metformin was also found to be as good as or better than placebo in improving menstrual frequency (RR 1.25 [95% CI 0.98, 1.61]). On the other hand, use of oral contraceptive pills (OCPs) significantly increased quality of life. There were significantly more gastrointestinal side effects observed in patients who received metformin compared to placebo (RR 3.39 [95% CI 0.97, 11.90]). These include abdominal pain, diarrhea, and flatulence. In addition, there were more cases of headache, breast pain, dysmenorrhea, abnormal uterine bleeding, and hot flashes with OCP use compared to placebo. The overall certainty of evidence was very low due to serious risk of bias, indirectness, and imprecision from small trials.

BURDEN OF DISEASE

PCOS can be diagnosed using the Rotterdam criteria based on (a) a history of menstrual irregularity, and (b) clinical or biochemical hyperandrogenism signs such as acne, hirsutism, and/or male-pattern hair loss, and (c) ultrasonography findings of polycystic ovaries. To diagnose PCOS, the two out of the three criteria must be met, excluding other causes [55] (Table 14).

Table 14. Rotterdam classification criteria for polycystic ovary syndrome [56,57]

Oligo-anovulation	Hyperandrogenism	Polycystic ovaries
• Bleeding interval <21 days • Bleeding interval >35 days, <8 episodes of menses/year • Infertility • No menstruation for 3 consecutive months in the last 12 months	• Clinical: Hirsutism (modified Ferriman-Gallwey score ≥8), acne, male-pattern alopecia • Biochemical Elevated total testosterone or free testosterone, elevated androstenedione, elevated dehydroepiandrosterone, elevated dehydroepiandrosterone sulfate	• ≥12 follicles, 2-9 mm in diameter • Ovarian volume >10 mL in one ovary

BENEFITS AND HARMS

Studies on the effect of medical treatment by metformin or OCPs compared to placebo among obese adult patients diagnosed with PCOS were included in this review. Eighteen RCTs compared metformin (1,500–2,000 mg per day, for 35 days–12 months) to placebo among patients with obesity (n=979), and three RCTs studied the use of OCPs (ethinyl estradiol combined with desogestrel, norethindronate or cyproterone acetate) among patients with obesity (n=132).

The use of metformin was as good as or better than placebo for improving menstrual frequency or regularity (RR 1.25 [95% CI 0.98, 1.61]) [58–61], and it significantly increased pregnancy rate across six RCTs (RR 1.62 [95% CI 1.16, 2.25]) [62–67] (Table 15). Metformin use also resulted in a significantly decreased FBS (MD -4.44 mg/dL [95% CI -7.00, -1.88]) [58,65,67–72], but its benefit was inconclusive for hyperandrogenism (based on Ferriman-Galleway scores) [68,69] and for both systolic and diastolic blood pressure [58,60,65]. However, there were significantly more gastrointestinal side effects observed in patients who received metformin compared to placebo (RR 3.39 [95% CI 0.97, 11.90]) [61,63,70,73,74]. These include abdominal pain, diarrhea, and flatulence.

The benefit of OCPs compared to placebo was inconclusive for the following outcomes: hyperadrogenism, pregnancy rate, FBS, systolic blood pressure, and diastolic blood pressure [75,76]. However, the use of OCPs significantly improved quality of life on the domains of emotion, hair, menstruation, and weight using the Polycystic Ovary Syndrome Quality of Life questionnaire (Table 15). In addition, there were more cases of headache, breast pain, dysmenorrhea, abnormal uterine bleeding, and hot flashes with OCP use compared to placebo.

The overall certainty of evidence for included studies on metformin compared to placebo was downgraded to low due to serious risk of bias and imprecision (low event rate) across different outcomes. The overall certainty of evidence for included studies on OCP compared to placebo was downgraded to low due to indirectness and imprecision (low event rate) across different outcomes.

Table 15. Efficacy and safety of metformin and of oral contraceptive pills compared to placebo among adult patients with obesity and with polycystic ovarian syndrome

Outcomes [Unit]	No. of Studies (No. of Participants)	Effect Estimate [95% CI]	Interpretation	Certainty of Evidence
Metformin				
Improved menstrual frequency	4 RCTs (n=297) [58–61]	RR 1.25 [0.98, 1.61]	As good as or better	Very Low
Hyperandrogenism[a]	2 RCTs (n=53) [68,69]	MD -1.37 [-4.52, 1.78]	Inconclusive	Low
Fertility[b]	6 RCTs (n=408) [62–67]	RR 1.62 [1.16, 2.25]	Beneficial	Low
FBS [mg/dL]	8 RCTs (n=260) [58,65,67–72]	MD -4.44 [-7.00, -1.88]	Beneficial	Very Low
SBP [mmHg]	3 RCTs (n=190) [58,60,65]	MD -1.36 [-6.86, 4.14]	Inconclusive	Low
DBP [mmHg]	3 RCTs (n=190) [58,60,65]	MD -0.78 [-3.07, 4.62]	Inconclusive	Low
Any GI side effects (abdominal pain, diarrhea, flatulence)	5 RCTs (n=296) [61,63,70,73,74]	RR 3.39 [0.97, 11.90]	Harm	Moderate
Oral Contraceptives				
Hyperandrogenism[a]	1 RCT (n=20) [75]	MD -1.60 [-6.44, 3.24]	Inconclusive	Low
Fertility[b]	1 RCT (n=100) [76]	RR 1.08 [0.56, 2.05]	Inconclusive	Low
FBS [mg/dL]	1 RCT (n=20) [75]	MD -5.80 [-15.87, 4.27]	Inconclusive	Low
SBP [mmHg]	1 RCT (n=20) [75]	MD -4.60 [-13.57, 22.77]	Inconclusive	Low
DBP [mmHg]	1 RCT (n=20) [75]	MD 4.70 [-3.47, 12.87]	Inconclusive	Low
QOL, PCOSQ Emotions[c]	1 RCT (n=100) [76]	MD 0.40 [0.06, 0.74]	As good as or better	Low
QOL, PCOSQ Infertility[c]	1 RCT (n=100) [76]	MD 0.40 [-0.05, 0.85]	As good as or better	Low
QOL, PCOSQ Hair[c]	1 RCT (n=100) [76]	MD 0.80 [0.42, 1.18]	Beneficial	Low
QOL, PCOSQ Menstruation[c]	1 RCT (n=100) [76]	MD 0.80 [0.38, 1.22]	Beneficial	Low
QOL, PCOSQ Weight[c]	1 RCT (n=100) [76]	MD 0.60 [0.15, 1.05]	Beneficial	Low
QOL, SF-12 Physical[d]	1 RCT (n=100) [76]	MD 0.40 [-0.15, 0.95]	As good as or better	Low
QOL, SF-12 Mental[d]	1 RCT (n=100) [76]	MD 0.40 [-0.15, 0.95]	As good as or better	Low
Headache	1 RCT (n=100) [76]	RR 1.20 [0.68, 2.11]	Inconclusive	Low
Breast pain	1 RCT (n=100) [76]	RR 6.00 [0.75, 48.05]	Harm	Low
Dysmenorrhea	1 RCT (n=100) [76]	RR 3.00 [0.32, 27.87]	Harm	Low
Abnormal uterine bleeding	1 RCT (n=100) [76]	RR 13.00 [0.75, 224.77]	Harm	Low
Hot flashes	1 RCT (n=100) [76]	RR 0.77 [0.18, 3.23]	Inconclusive	Low

CI confidence interval; DBP diastolic blood pressure; FBS fasting blood sugar; GI gastrointestinal; MD mean difference; PCOSQ Polycystic Ovary Syndrome Quality of Life questionnaire; QOL quality of life; RCT randomized controlled trial; RR risk ratio; SBP systolic blood pressure; SF-12 short-form survey questionnaire

[a] based on Ferriman-Galleway Scores

[b] based on pregnancy rate

[c] scored from 0-7, where 7=better function

[d] scored from 0-100, where 100=best physical health function

COST IMPLICATION

There was no available economic evaluation in the Philippines on the screening and treatment of PCOS in women with obesity. In the United States for the year 2020, the estimated excess cost of treating long-term complications (including diabetes mellitus) attributed to PCOS was

USD 3.9 billion [77]. Table 16 summarizes available information on the cost of interventions for PCOS in the Philippines.

Table 16. Costs of interventions for polycystic ovarian syndrome*

Interventions (Dose, if any)	Brand	Unit Cost	Cost per Year
Fasting Blood Sugar	-	PHP 100.00	-
Transvaginal Ultrasound	-	PHP 1,500.00	-
Metformin 500 mg (3x a day)	Ritemed	PHP 3.50	PHP 3,832.50
	Glucophage	PHP 18.25	PHP 19,983.75
Metformin 850 mg (2x a day)	Ritemed	PHP 7.50	PHP 5,475.00
	Glucophage	PHP 29.25	PHP 21,352.50
Ethinyl Estradiol + Levonorgestrel 30/150 mcg (per month)	Lady	PHP 50.25	PHP 603.00
Ethinyl Estradiol + Cyproterone Acetate 35 mcg/2 mcg (per month)	Althea	PHP 514.00	PHP 6,168.00
Esthinylestradiol + Drospirenone 30/3 mcg (per month)	Liza	PHP 680.00	PHP 8,160.00

*Costs as of the writing of this CPG

EQUITY, ACCEPTABILITY, AND FEASIBILITY

In a qualitative study of women diagnosed with PCOS using the Rotterdam criteria, pain, and discomfort (27.6%) were the most common complaints, followed by hair loss and growth (16.2%) and menstrual irregularity (15.8%) [78]. Weight gain and bloating are also common concerns (12.1%), but are ranked as the most bothersome by patients (9.6/10), followed by infertility and problems in reducing weight. Weight and signs of hirsutism were also correlated with lower quality of life scores [79]. Additionally, the impact on emotional functioning includes depression, worry, anxiety, embarrassment, and frustration, as well as the effect on family and intimate relationships [78].

RECOMMENDATIONS FROM OTHER GROUPS

Table 17. Recommendations from other guidelines, organizations, or societies on the assessment and management of polycystic ovarian syndrome

Group (Year)	Recommendation	Strength of Recommendation/ Certainty of Evidence
International PCOS Network (2018) [80]	We endorse the Rotterdam PCOS diagnostic criteria in adults (two of clinical or biochemical hyperandrogenism, ovulatory dysfunction, or polycystic ovaries on ultrasound) and where irregular menstrual cycles and hyperandrogenism are present, highlight that ultrasound is not necessary in diagnosis.	Consensus
	The OCP alone should be recommended in adult women with PCOS for management of hyperandrogenism and/or irregular menstrual cycles.	Strong, Low
	Specific types or dose of progestins, estrogens or combinations of OCP cannot currently be recommended in adults and adolescents with PCOS and practice should be informed by general population guidelines	Conditional, Low

Group (Year)	Recommendation	Strength of Recommendation/ Certainty of Evidence
	Metformin in addition to lifestyle, could be recommended in adult women with PCOS, for the treatment of weight, hormonal and metabolic outcomes.	Conditional, Low
	Metformin in addition to lifestyle, should be considered in adult women with PCOS with BMI ≥25 kg/m^2 for management of weight and metabolic outcomes.	Conditional, Low
	Metformin could be used alone in women with PCOS, with anovulatory infertility and no other infertility factors, to improve ovulation, pregnancy and live birth rates, although women should be informed that there are more effective ovulation induction agents.	Conditional, Moderate
Endocrine Society (2013) [81]	We suggest that the diagnosis of PCOS be made if two of the three following criteria are met: androgen excess, ovulatory dysfunction, or PCO, whereas disorders that mimic the clinical features of PCOS are excluded.	Weak, Moderate
	Women with PCOS are at increased risk of anovulation and infertility; in the absence of anovulation, the risk of infertility is uncertain. We recommend screening ovulatory status using menstrual history in all women with PCOS seeking fertility.	Strong, Low
	We recommend the use of an OGTT (consisting of a fasting and 2-hour glucose level using a 75-g oral glucose load) to screen for IGT and T2DM in adolescents and adult women with PCOS because they are at high risk for such abnormalities.	Strong, Moderate
	We recommend OCPs (ie, oral contraceptives, patch, or vaginal ring) as first-line management for the menstrual abnormalities and hirsutism/acne of PCOS, which treat these two problems concurrently.	Strong, Low
	We suggest against the use of metformin as a first-line treatment of cutaneous manifestations, for prevention of pregnancy complications, or for the treatment of obesity.	Weak, Low
	We recommend metformin in women with PCOS who have T2DM or IGT who fail lifestyle modification	Strong, Moderate
	For women with PCOS with menstrual irregularity who cannot take or do not tolerate OCPs, we suggest metformin as second-line therapy	Weak, Moderate

BMI body mass index; IGT impaired glucose tolerance; OCP oral contraceptive pill; OGTT oral glucose tolerance test; PCOS polycystic ovarian syndrome; T2DM type 2 diabetes mellitus

Should we screen for dysglycemia using a 75-gram oral glucose tolerance test among adult Filipinos with obesity?

Among adult Filipinos with obesity, we suggest screening for dysglycemia using 75-gram oral glucose tolerance test once a year. (Very low certainty of evidence, Weak recommendation)

CONSENSUS ISSUES

Given the very low certainty of evidence, the Consensus Panel agreed on a weak recommendation for using the 75-gram oral glucose tolerance test (OGTT) to screen for dysglycemia. However, the Panel members emphasized that aside from pharmacologic and surgical interventions, there is also evidence pointing to the effectiveness of lifestyle modifications (e.g., exercise and nutrition coaching programs) to address dysglycemia, which would increase the downstream benefits of screening among individuals with obesity.

KEY FINDINGS

The review found no direct RCTs on the use of the 75-gm OGTT to screen adults with obesity for dysglycemia. The included studies investigated the effect of hypoglycemic agents and bariatric surgery as management for adults with obesity and with dysglycemia. Hypoglycemic agents such as metformin, liraglutide, and pioglitazone decreased the incidence of diabetes mellitus (RR 0.41 [95% CI 0.19, 0.88], I^2=92%), but did not show significant effect on CVD incidence. Data from two RCTs on the effect of hypoglycemic agents on lipid profile could not be pooled, but one trial reported a significant decrease in total cholesterol, triglycerides, and low-density lipoprotein (LDL) after using liraglutide, and the other reported no significant differences in triglycerides after using pioglitazone. Bariatric surgery significantly lowered the incidence of diabetes mellitus when compared to no surgery (RR 0.05 [95% CI 0.01, 0.27]).

BURDEN OF DISEASE

Dysglycemia (an impaired glucose tolerance and/or impaired fasting glucose) [82] and type 2 diabetes mellitus exist as a continuum that burdens obese patients globally. Among overweight and obese patients, screening for dysglycemia provides an opportunity for clinicians to institute interventions early for primary prevention of diabetes and other complications associated with this chronic disease.

The 75-gm OGTT is used for the diagnosis of diabetes mellitus. However, it can also be used to detect individuals with prediabetes. Generally, recommendations consider OGTT as equally appropriate as FBS and glycated hemoglobin (HbA1C) testing for screening among adults [82–84]. However, using OGTT leads to greater accuracy of diabetes detection with a sensitivity of 90–93% and a specificity of 100% [85]. Among patients with overweight and obesity, screening for dysglycemia provides an opportunity for clinicians to institute interventions early for primary prevention of diabetes mellitus and other complications associated with this chronic disease.

BENEFITS AND HARMS

Based on three RCTs, use of hypoglycemic agents (e.g., metformin, liraglutide, pioglitazone) compared to placebo reduced the incidence of diabetes mellitus (RR 0.41 [95% CI 0.19, 0.88]) (Table 18), but there was significant heterogeneity possibly due to different agents used (I^2= 92%) [86–88]. Bariatric surgery also significantly lowered the incidence of diabetes mellitus compared to no surgery (RR 0.05 [95% CI 0.01, 0.26]; I^2=0%) based on data from two non-randomized trials [89,90].

Two RCTs reported on change in lipid profile. One small RCT reported a significant decrease in total cholesterol (mean 172.2 mg/dL vs. 185.9 mg/dL, p<0.001), triglycerides (mean 127.8 mg/dL vs. 135.1 mg/dL, p<0.001), and LDL (mean 99.7 mg/dL vs. 112.3 mg/dL, p<0.001) after 14 weeks of liraglutide versus placebo [91] (Table 18). However, a larger RCT reported no significant difference in the decrease in triglycerides between pioglitazone and placebo [88]. Neither pioglitazone nor placebo altered levels of LDL, and no data on change in total cholesterol were reported. Pooling was not done due to inadequate data provided. There was also no significant difference in the incidence of CVD, which was defined as non-fatal myocardial infarction, non-fatal stroke, or congestive heart failure [86,88].

Table 18. Efficacy of hypoglycemic agents and of bariatric surgery for addressing dysglycemia-related outcomes

Outcomes	No. of Studies (No. of Participants)	Effect Estimate [95% CI]	Interpretation	Certainty of Evidence
Hypoglycemic agents vs. placebo				
DM	3 RCTs (n=4,967) [86–88]	RR 0.41 [0.19, 0.88]	Beneficial	Very low
CVD	2 RCTs (n=2,881) [86,88]	RR 1.22 [0.34, 4.30]	Inconclusive	Low
DLD	2 RCTs (n= 653) [88,91]	Liraglutide vs. placebo → significant decrease in TG (MD 7.3 mg/dL, p<0.001) and LDL (MD 12.6 mg/dL, p<0.001). Pioglitazone had no significant difference in TG or LDL levels.	Beneficial	Very low
Bariatric surgery vs. no surgery				
DM	2 RCTs (n=252) [89,90]	RR 0.05 [0.01, 0.27]	Beneficial	Very Low

CVD cardiovascular disease; DLD dyslipidemia; DM diabetes mellitus; LDL low-density lipoprotein; MD mean difference; RCT randomized controlled trial; RR risk ratio; TG triglyceride

Three RCTs reported on SAEs with the use of hypoglycemic agents versus placebo. One RCT noted more adverse events with pioglitazone (RR 1.23 [95% CI 1.03, 1.47]), including fractures (3% vs. 2.6%) [88]. Another large, multi-center RCT reported increased incidence of cholelithiasis, cholecystitis and pancreatitis with liraglutide compared to placebo [86]. Non-SAEs (gastrointestinal symptoms such as diarrhea, flatulence, nausea, and vomiting) were reported with metformin use [87]. Data was not pooled due to inadequate data provided. Adverse events associated with bariatric surgery compared to no surgery in obese patients with dysglycemia were not reported.

OGTT is associated with minimal risks. The glucose solution can cause nausea, vomiting, bloating or headache. Venipuncture may cause excessive bleeding, hematoma, lightheadedness, infection, and multiple punctures [92].

Of the six included studies, two studies had an overall high risk of bias due to lack of blinding of surgical intervention, leading to selection and performance bias. The study by Ariel et al. [91] had high risk of attrition bias. Three studies have overall some risks of bias. The study by le Roux et al. [86] had unclear risk for attrition bias, the study by Knowler et al. [87] had unclear risk for selection, performance and detection bias, and the study by DeFronzo et al. [88] had unclear risk for detection and reporting bias.

Three studies involved a small number of the population [89–91], while two studies had small number of events for one outcome measure [86,88]. The certainty of evidence was downgraded to very low because of serious risk of bias, indirectness to the research question, and imprecision across different critical outcomes.

COST IMPLICATION

There are no local cost-effectiveness studies on dysglycemia screening among individuals with obesity. However, a study done in the United States among adults with overweight or obesity have shown screening for pre-diabetes and treating those identified as having impaired glucose tolerance and impaired fasting glucose is cost-effective relative to no screening [93].

The cost for OGTT is considerably higher compared to FBS and HbA1c [94,95] (Table 19). Treatment cost for diabetes mellitus in the Philippines ranged from a mean (SD) of USD 454.00 (1,253.00) and USD 2,973.00 (6,166.00) based on a review of electronic hospital records in two tertiary hospitals in the Philippines and on cross-sectional survey of physicians providing outpatient care for people with diabetes mellitus [96]. Bariatric surgery in the Philippines (excluding pre-operative evaluation and healthcare professional fees) costs an average of USD 4,000.00 (equivalent to PHP 191,409.00 as of October 2021). PHIC provides reimbursement for bariatric procedures, while private insurance providers in the country do not provide coverage for such procedures [97].

Table 19. Costs of screening for dysglycemia* [94,95]

Test	Cost
OGTT	PHP 800.00 (government); PHP 1,200.00 – 1,700.00 (private)
FBS	PHP 155.00 (government); PHP 300.00 (private)
HbA1c	PHP 650.00 (government); PHP 1,220.00 (private)

FBS fasting blood sugar; OGTT oral glucose tolerance test
*Costs as of the writing of this CPG

EQUITY, ACCEPTABILITY, AND FEASIBILITY

Saleh Mshelia et al. (2021) reported that the OGTT, being more costly, time-consuming, and cumbersome, makes the test a less common choice among patients as screening for dysglycemia [98]. Reproducibility of the test is also an issue as glucose values after 75-gm glucose loading may be influenced by insulin sensitivity, enteric hormones, and responses to nutrient ingestion, such as gastrointestinal motility and emptying [99,100]. FBS has been recommended by the American Diabetes Association Expert Committee because of its ease of administration, convenience, acceptability to patients, and lower costs [98]. HbA1c does not require a fasting state compared with OGTT and FBS and has been used for monitoring glycemic control over a 3-month period.

RECOMMENDATIONS FROM OTHER GROUPS

Table 20. Recommendations from other guidelines, organizations, or societies on the assessment of dysglycemia and diabetes mellitus

Group (Year)	Recommendation	Strength of Recommendation/ Certainty of Evidence
ADA (2022) [82]	Screen adults who are overweight or obese (BMI ≥25 or ≥23 in Asian American persons) with 1 or more risk factors[a], regardless of age.	Grade B Supportive evidence from well-conducted cohort or observation studies.
AACE (2022) [83]	Screen all adults who are obese (BMI ≥30), and those who are overweight (BMI 25 to 30 or >23 in Asian Americans) and have additional risk factors.	
USPSTF (2021) [101]	Screen for prediabetes and T2DM in adults aged 35 to 70 years who are overweight or obese. Clinicians should offer or refer patients with prediabetes to effective preventive interventions.	Grade B High certainty that the net benefit is moderate, or there is moderate certainty that the net benefit is moderate to substantial.

AACE American Association of Clinical Endocrinology; ADA American Diabetes Association; BMI body mass index; T2DM type 2 diabetes mellitus; USPSTF U.S. Preventive Services Task Force

[a] First-degree relative with diabetes, high-risk race/ethnicity (e.g. African American, Latino, Native American, Asian American, Pacific Islander), history of CVD, hypertension (≥140/90 mmHg or therapy for hypertension), HDL cholesterol <35 mg/dl (0.9 mmol/L) and/or triglyceride level >250 mg/dl (2.82 mmol/L), women with PCOS, physical inactivity, other clinical conditions associated with insulin resistance (e.g. severe obesity, acanthosis nigricans)

Should we screen for dyslipidemia using a fasting lipid profile among adult Filipinos with obesity?

Among adult Filipinos with obesity, we recommend screening for dyslipidemia using a fasting lipid profile. (Very low certainty of evidence, Strong recommendation)

CONSENSUS ISSUES

Despite the very low overall certainty of evidence, the Panel decided on a strong recommendation given the long-term consequences of obesity and dyslipidemia including adverse CV outcomes. They also recognize that screening provides an opportunity for early intervention. Majority of the panelists (58%) favored annual over semiannual screening after a two-round modified Delphi activity mainly due to the costs incurred with more frequent testing.

KEY FINDINGS

There was no direct evidence on lipid screening versus no lipid screening among adults with obesity. The included studies investigated the effectiveness of management among patients with obesity and with dyslipidemia. Eight RCTs looked into the effect of the Dietary Approaches to Stop Hypertension (DASH) diet on patients with obesity. Patients with obesity in the DASH group had better quality of life scores and greater reductions in serum aspartate transferase (AST) and alanine transaminase (ALT) levels. The DASH intervention also resulted in a significantly greater decrease in systolic and diastolic blood pressure. No adverse events were reported in both DASH diet and usual diet groups. Overall, the certainty of evidence was very low due to reliance on indirect evidence, issues on allocation concealment and incomplete outcome reporting, as well as imprecision of effect estimates.

BURDEN OF DISEASE

Obesity is a prominent component of the metabolic syndrome, along with atherogenic dyslipidemia, which manifests as elevated serum triglycerides >150 mg/dL and HDL<35 mg/dL. Metabolic syndrome increases the risk of diabetes and its complications, and it predisposes an individual to develop CVD [12]. One of the non-pharmacological approaches to address the metabolic syndrome is the DASH diet. It was created in the 1990s and has since then been used to control hypertension and other metabolic conditions. The diet is usually composed of seven servings of carbohydrates, two servings of low-fat dairy products, at most two servings of lean red meat, five servings of vegetables, and five servings of fruits, with two or three weekly servings of nuts and seeds [102].

BENEFITS AND HARMS

One RCT reported that obese patients with heart failure in the DASH group had better quality of life scores using the Minnesota Living with Heart Failure Questionnaire at 3-month follow-up (mean score 21 vs. 39 points; p=0.006) [103] (Table 21). Among overweight and obese adults with NAFLD, consuming a DASH-type diet for 8 weeks demonstrated greater reductions in AST (MD -10.7 ± 25.1 IU/L vs. MD -1.6 ± 9.6 IU/L), ALT (MD -8.4 ± 16.5 IU/L vs. MD 3.8 ± 23.8 IU/L) and ALP (MD -26.3 ± 36.1 U/L vs. MD 4.3 ± 34.1 U/L) compared to the control group [104]. The pooled result from two RCTs (n=180) showed also that there was a significant decrease in both systolic (MD -3 mmHg [95% CI -3.93, -2.07]; I^2=0%) and diastolic blood pressure (MD -4.24 mmHg [95% CI -7.94, -0.54]; p=0.02; I^2=96%) among the obese patients on the DASH diet intervention [105,106].

However, meta-analyses on three RCTs (n=108) showed that the DASH diet did not significantly change total cholesterol, triglycerides, and LDL cholesterol levels [105,107,108]. The DASH diet resulted in lower HDL cholesterol levels when compared to a usual diet (MD -1.30 mg/dL [95% CI -2.18, -0.42]; I^2=15%) [105,107,108] (Table 21). A meta-analysis of four RCTs (n=224) revealed no significant effect of DASH diet in fasting plasma glucose [106–109].

There were no reported adverse events or outcomes among the patients in the DASH diet intervention or usual diet intervention in the included RCTs.

The included trials were of moderate to high risk of bias due to unclear allocation concealment, lack of blinding and incomplete outcome data. The certainty of evidence was also downgraded due to indirectness and imprecision with wide confidence intervals. Overall, the certainty of evidence was very low across the different critical outcomes.

Table 21. Efficacy of the DASH diet for addressing dyslipidemia-related outcomes

Outcomes [Unit]	No. of Studies (No. of Participants)	Effect Estimate [95% CI]	Interpretation	Certainty of Evidence
QOL[a]	1 RCT (n=48) [103]	DASH diet: mean 21 (SD 15) vs. Control: mean 39 (SD 22) (p=0.006)	Beneficial	Low
TG [mg/dL]	3 RCTs (n=108) [105,107,108]	MD -8.61 [-36.34, 19.12]	Inconclusive	Very Low
HDL [mg/dL]	3 RCTs (n=108) [105,107,108]	MD -1.30 [-2.18, -0.42]	Harmful	Very Low
FBS [mg/dL]	4 RCTs (n=224) [106–109]	MD 0.99 [-5.96, 7.94]	Inconclusive	Very Low
NAFLD	1 RCT (n=60) [104]	Among adults with overweight or obese and with NAFLD: DASH	Beneficial	Low

Outcomes [Unit]	No. of Studies (No. of Participants)	Effect Estimate [95% CI]	Interpretation	Certainty of Evidence
		diet vs. control (8 weeks) → AST [MD -10.7 (SD 25.1 IU/L) vs. -1.6 (SD 9.6 IU/L)], ALT [MD -8.4 (SD 16.5 IU/L) vs. 3.8 (SD 23.8 IU/L)]		
SBP [mmHg]	2 RCTs (n=180) [105,106]	MD -3 [-3.93, -2.0]	Beneficial	Low
DBP [mmHg]	2 RCTs (n=180) [105,106]	MD -4.24 [-7.94, -0.54]	Beneficial	Low

ALT alanine transaminase; AST aspartate aminotransferase; CI confidence interval; DASH Dietary Approaches to Stop Hypertension; DBP diastolic blood pressure; FBS fasting blood sugar; HDL high-density lipoprotein; MD mean difference; NAFLD nonalcoholic fatty liver disease; QOL quality of life; RCT randomized controlled trial; SBP systolic blood pressure; TG triglyceride

[a] MLHFQ score (0-105, best to worst quality of life)

COST IMPLICATION

Screening for lipid disorders using a fasting lipid profile was more cost-effective than not screening but may be more expensive for subpopulations with other comorbidities and adverse effects related to treatment [110,111]. However, among the elderly, screening for dyslipidemia may be more costly due to other co-morbidities and adverse effects related to treatment [110]. The costs associated with dyslipidemia screening are summarized in Table 22.

Table 22. Estimated annual cost of screening for dyslipidemia*

Parameter	Screening Intervention	Cost
Unit cost of screening intervention	Lipid profile	PHP 445.00 [112]
Other direct costs associated with the implementation of the proposed screening intervention	Initial and follow-up outpatient consultations with primary care physicians or specialists	2 x (PHP 500.00–1,000.00) = PHP 1,000.00–2,000.00
	Initial and follow-up outpatient consultations with nutritionist dietician	2 x (PHP 400.00–800.00) = PHP 800–1,600.00
	Meal Plan	PHP 1,000.00
Annual screening cost per patient		PHP 3,245.00–5,045.00

*Costs as of the writing of this CPG

A cost-effectiveness study found that the DASH diet program had lower incremental cost-effectiveness ratios (ICERs) per disability-adjusted life-year (DALY) than low-fat diet programs [AUS 12,000.00 (PHP 439,505.00)/DALY vs. AUS 13,000.00 (PHP 476,131.00)/DALY] [113]. Items on the DASH diet were also more available but more expensive in stores with higher socioeconomic status [75%; USD 40.20 (PHP 2,203.00) per person per week) vs. 46%; USD 30.73 (PHP 1,685.00) per person per week] [114].

EQUITY, ACCEPTABILITY, AND FEASIBILITY

The barriers to adopting the DASH diet among African Americans of low socioeconomic status are similar to what may be experienced in the local setting. These include the availability of fruits, vegetables and lean meat; limitations in food storage; possible disagreement with other family members regarding food choices; and uncommon food items or food preparation techniques [115]. Compliance to the DASH diet was observed to be lower among individuals with the lowest economic accessibility to supermarkets (OR 0.59 [95% CI 0.52, 0.68]) after adjusting for key demographics and exposure to other food outlets [116].

RECOMMENDATIONS FROM OTHER GROUPS

Table 23. Recommendations from other guidelines, organizations, or societies on the assessment of dyslipidemia

Group (Year)	Recommendation	Strength of Recommendation/ Certainty of Evidence
AACE/ACE (2016) [13]	All patients with overweight or obesity and individuals experiencing progressive weight gain should be screened for dyslipidemia with a lipid panel that includes TG, HDLc, calculated LDLc, TC and non-HDLc	Grade A BEL 2, upgraded due to high relevance
	All patients with dyslipidemia should be evaluated for the presence of overweight or obesity	

AACE American Association of Clinical Endocrinologists; ACE American College of Endocrinology; HDLc high-density lipoprotein cholesterol; LDLc low-density lipoprotein cholesterol; TC total cholesterol; TG triglyceride

Should we screen for hypertension among adult Filipinos with obesity?

Among adult Filipinos with obesity, we recommend screening for hypertension using a non-invasive blood pressure measurement with an appropriately-sized cuff at least once a year. (Very low certainty of evidence, Strong recommendation)

CONSENSUS ISSUES

Despite the very low certainty of evidence, the Consensus Panel voted for a strong recommendation due to the benefits of early detection and early interventions for hypertension.

KEY FINDINGS

No direct evidence was found on the effect of screening for hypertension using history and physical examination. Pooled diagnostic accuracy estimates based on data from six cross-sectional studies showed that measuring blood pressure using a correctly fitted blood pressure cuff among adults had a high sensitivity (87% [95% CI 79, 93]) and a high specificity (85% [95% CI 64, 95]).

Indirect evidence also came from four diagnostic cross-sectional studies and 24 RCTs on treatment with anti-hypertensives. Increased adverse events were observed that were attributable to antihypertensives. Intensive blood pressure lowering also had no significant effect on mortality and CVD. However, antihypertensives reduced the risk of stroke (HR 0.62 [95% CI 0.41, 0.94]; RR 0.63 [95% CI 0.49, 0.81]) and diabetes mellitus (HR 0.83 [95% CI 0.72, 0.95] among BMI 30–34.9 kg/m^2; HR 0.79 [95% CI 0.63, 0.99] among BMI ≥35 kg/m^2). Overall, the certainty of evidence was very low due to risk of bias (randomization and allocation sequence issues), indirectness and imprecision.

BURDEN OF DISEASE

In individuals who become obese in early adulthood, there is a threefold risk of developing hypertension; this risk is still observed if obesity develops later in life [117]. The mechanisms of obesity-related hypertension encompass overactivation of the sympathetic nervous system, stimulation of the renin-angiotensin-aldosterone system, functional changes in the kidneys, and changes in leptin levels and insulin resistance [118].

Hypertension, as defined in most international guidelines, corresponds to a properly taken office blood pressure reading of ≥140/90 (Appendix 4) [119]. Non-invasive blood pressure measurement is usually a quick and straightforward procedure, but blood pressure measurement in individuals with obesity may be affected by the cuff and bladder size of the sphygmomanometer [120]. The recommended cuff bladder dimensions are a length of 75–100% of the patient's measured arm circumference, a width of 37–50% of the patient's arm circumference, and a length-to-width ratio of 2:1 [121] (Table 24). Blood pressure measurement errors may result from under-cuffing, which is when the bladder size is too small for the patient's arm size, leading to overestimation.

Table 24. Recommended cuff sizes based on arm circumference [122]

Arm Circumference (cm)	Recommended Cuff Size (width x length in cm)
22–26	12 x 22 (small adult)
27–34	16 x 30 (adult)
35–44	16 x 36 (large adult)
45–52	16 x 42 (extra-large adult)

Blood pressure control aims to reduce the risk of hypertension-related complications, leading to reduction of mortality in the long term. To achieve this, patients with obesity and hypertension are more likely to need more medications to control their blood pressure, compared to patients who are lean [123]. Lifestyle therapy, consisting of nutritional management and regular physical activity, is a consistent recommendation in the treatment of both hypertension and obesity. A 5–15% weight loss is recommended to achieve clinically meaningful effects, including reduction in blood pressure and in the number and/or doses of medications needed to control hypertension [13].

BENEFITS AND HARMS

Two RCTs on the effect of anti-hypertensive medications on patients with obesity and one meta-analysis on the effect of anti-hypertensive medications on new-onset diabetes mellitus were assessed.

With intensive blood pressure-lowering therapy, there was no significant difference in the incidence of mortality and CVD (stroke, CVD death and non-fatal myocardial infarction) [124]. Meanwhile, anti-hypertensive use reduced the risk of stroke by almost 40% in two trials (HR 0.62 [95% CI 0.41, 0.94]; RR 0.63 [95% CI 0.49, 0.81]) [124,125] (Table 25).

Each 5-mmHg reduction in systolic blood pressure was found to reduce the risk for diabetes by 11% (HR 0.89 [95% CI 0.84, 0.95]) [126] (Table 25). Angiotensin-converting enzyme-I inhibitors (HR 0.84 [95% CI 0.76, 0.92]) and angiotensin II receptor blockers (HR 0.84 [95% CI 0.76, 0.93]) both reduced the risk for diabetes compared to placebo, while calcium channel blockers had no significant effect. Beta blockers (1.48 [95% CI 1.27, 1.72]) and thiazide diuretics (1.20 [95% CI 1.07, 1.35]) were found to increase the risk for diabetes. Focusing on the obese subgroups, a 5-mmHg reduction in blood pressure also resulted in lower risk of diabetes (BMI 30.0–34.9: HR 0.83 (95% CI 0.72, 0.95); BMI ≥35: HR 0.79 [95% CI 0.63, 0.99]).

In the ACCORD trial, there were more SAEs attributable to anti-hypertensives (e.g., hypotension, syncope, bradycardia) in the intensive therapy group (3.3% vs. 1.27%, p<0.001) [127]. The incidence of reduced glomerular filtration rate to <30 mL/min/1.73m^2 was higher in the intensive blood pressure-lowering group (4.2% vs. 2.2%, p<0.001).

The studies had moderate to high risk of bias due to unclear randomization and allocation sequence concealment. We also downgraded due to imprecise estimates for mortality and CVD, and indirectness (not a direct trial of screening, inclusion of participants without obesity).

Table 25. Efficacy and safety of anti-hypertensive treatment on hypertension-related outcomes

Outcomes	No. of Studies (No. of Participants)	Effect Estimate [95% CI]	Interpretation	Certainty of Evidence
Mortality	1 RCT (n=4,687) [124]	HR 1.04 [0.72, 1.49]	Inconclusive	Very low
Stroke	2 RCTs (n=9,423) [124,125]	HR 0.62 [0.41, 0.94] RR 0.63 [0.49, 0.81]	Benefit	Very low
CVD	1 RCT (n=4,687) [124]	HR 0.89 [0.74, 1.08]	Inconclusive	Very Low
DM	22 RCTs (n=145,308) [126]	Each 5-mmHg reduction in BP: BMI 30–34.9: HR 0.83 [0.72, 0.95] BMI ≥35: HR 0.79 [0.63, 0.99]	Benefit	Low
AEs	1 RCT (n=4,733) [127]	SAEs: 3.3% vs. 1.27% (p<0.001) GFR <30 mL/min/1.73 m^2: 4.2% vs. 2.2% (p<0.001)	Inconclusive	Low

AE adverse event; CI confidence interval; CVD cardiovascular disease; DM diabetes mellitus; GFR glomerular filtration rate; HR hazard ratio; RCT randomized controlled trial; RR risk ratio; SAE serious adverse event

DIAGNOSTIC PERFORMANCE

Data from a meta-analysis on the diagnostic accuracy of blood pressure measurements among patients with obesity was included in this review. The pooled sensitivity for non-invasive blood pressure determination using a correctly fitting blood pressure cuff in adults with obesity was 87% (95% CI 0.79, 0.93), and pooled specificity was 85% (95% CI 0.64, 0.95) [128] (Table 26). No statistical heterogeneity was detected (p=0.24). The certainty of evidence for the diagnostic accuracy of a properly fitting blood pressure cuff was downgraded due to issues of patient selection and the timing of the index test and reference standard as well as a wide interval estimate for specificity.

Table 26. Diagnostic accuracy of a non-invasive method of blood pressure determination [128]

Index test	No. of Studies (No. of Participants)	Estimate [95% CI]	Interpretation	Certainty of Evidence
Non-invasive BP measurement*	6 XS (n=163)	Sn 87% [79, 93]	High	Very low
		Sp 85% [64, 95]	High	Very low

BP blood pressure; CI confidence interval; Sn sensitivity; Sp specificity; XS cross-sectional study
*Comparator: invasive method of blood pressure determination

COST IMPLICATION

Screening for hypertension by history entails no additional cost to the patient or to the physician. Blood pressure determination is a standard component of routine physical examination. Properly fitting cuffs for blood pressure determination in a patient with obesity entails additional cost to the physician, clinic, or hospital (Table 27).

Table 27. Cost of blood pressure monitors and large-dimension cuffs in the Philippines*

Product	Price Range
Aneroid sphygmomanometer	PHP 299.00–849.00
Automatic blood pressure monitor	PHP 750.00–4,256.00
Aneroid sphygmomanometer-compatible wide range cuff	PHP 385.00–1,885.00
Automatic blood pressure monitor-compatible wide range cuff	PHP 480.00–2,100.00

*Costs as of the writing of this CPG

EQUITY, ACCEPTABILITY, AND FEASIBILITY

A nationwide survey of blood pressure, anthropometric measurements, risk factors, and comorbidity assessment conducted in January to April 2021 found an increasing trend in the prevalence of hypertension (37%) and a modest proportion with good blood pressure control (39%). Among the patients with hypertension, the average BMI was 26.4 kg/m^2 and concomitant CV risk factors (smoking, diabetes, angina) were also prevalent. Because only 52% of the patients with hypertension had personal awareness of having the disease, awareness and screening programs remain relevant in CVD prevention strategies for our population [129]. A study on the acceptability of home, kiosk, and clinic blood pressure measurement compared to 24-hour ambulatory blood pressure monitoring in the US showed best overall acceptability and adherence scores for home blood pressure followed by clinic measurement [130].

RECOMMENDATIONS FROM OTHER GROUPS

Table 28. Recommendations from other guidelines, organizations, or societies on the assessment of hypertension

Group (Year)	Recommendation	Strength of Recommendation/ Certainty of Evidence
AACE/ACE (2016) [13]	Recommends BP measurement in all patients with overweight or obesity to screen for hypertension or prehypertension	Strong recommendation (Grade A; BEL2, upgraded due to high relevance)
NICE (2022) [24]	Recommends assessment of any comorbidities, including hypertension	Strong recommendation

AACE American Association of Clinical Endocrinologists; ACE American College of Endocrinology; BP blood pressure; NICE National Institute for Health and Care Excellence

Should we screen for non-alcoholic fatty liver disease/non-alcoholic steatohepatitis among adult Filipinos with obesity?

Among adult Filipinos with obesity, we <u>suggest screening</u> for non-alcoholic fatty liver disease using liver ultrasound. (Very low certainty of evidence, Weak recommendation)

CONSENSUS ISSUES

The Consensus Panel recognizes that obesity itself is a risk factor for metabolic-associated fatty liver disease (MAFLD; formerly known as NAFLD). A diagnosis of MAFLD, as defined by the Asian Pacific Association for the Study of the Liver, is based on the presence of liver steatosis and at least one of the following: overweight or obesity, diabetes mellitus or metabolic dysfunction (e.g., increased waist circumference and an abnormal lipid or glycemic profile) [131].

However, the Panel gave a weak recommendation because of the following limitations:

- Screening may be difficult to implement in areas without access to a liver ultrasound.
- A screen-positive individual will require a referral to a specialist for confirmatory testing, which will necessitate additional costs.
- The linked management, GLP-1 receptor agonists (GLP-1-RAs), are also costly, and discontinuation of the medication is associated with rebound effects such as weight gain.
- Future recommendations could be more specific to MAFLD once there are more studies that use this definition of the disease.

KEY FINDINGS

There was no direct evidence found on the impact of routine screening for NAFLD using liver ultrasound among adults with obesity. Based on data from seven observational studies (n=1,445), the pooled sensitivity of liver ultrasound was 84.9% (95% CI 65.3, 94.4; I^2=92.6%) while pooled specificity was 48.6% (95% CI 24.7, 73.1; I^2=60.1%).

Treatment with GLP-1-RAs was associated with a greater probability of histological resolution of non-alcoholic steatohepatitis without worsening of liver fibrosis (RR 2.80 [95% CI 1.63, 4.81]; I^2=0). Receiving GLP-1-RAs also led to increased risk of diarrhea (RR 1.90 [95% CI 1.15, 3.12]) and of decreased appetite (RR 4.24 [95% CI 1.88, 9.57]) compared to those given a placebo. Risks for mortality and for SAEs were inconclusive. The overall certainty of evidence was very low due to risk of bias, inconsistency, indirectness, and imprecision.

BURDEN OF DISEASE

NAFLD is the most common cause of chronic liver disease worldwide [132]. The global prevalence of NAFLD is estimated to be 25%, while the prevalence in Asia is slightly higher at 27%. The prevalence varies within the Asia-Pacific region, which may be attributed to disparities in nutrition, lifestyle, and political and economic development among countries [133]. In the Philippines, the prevalence is lower at around 12%, but this figure may be underestimated due to the lack of effective screening tests to accurately ascertain NAFLD [134–136]. In contrast, a study done in Canada showed that Filipino immigrants had disproportionately higher prevalence of NAFLD compared to native counterparts [137].

Obesity has been shown to be a risk factor for NAFLD. Irrespective of race, NAFLD is especially prevalent among individuals with obesity, type 2 diabetes mellitus, hyperlipidemia, hypertension, and metabolic syndrome [138]. A cross-sectional study showed that among Filipinos, a BMI >25 kg/m^2 (OR 1.45), triglyceride levels >150 mg/dl (OR 1.31) and HbA1c >7% (OR 1.74) were associated with hepatic steatosis [139]. Obesity is also linked to non-alcoholic steatohepatitis (NASH), to NASH-related cirrhosis, and to hepatocellular carcinoma [140]. Patients with NASH were more likely to be obese and were more likely to develop hepatocellular carcinoma than patients with NAFLD [132,138].

Despite the high prevalence, the burden of NAFLD is expected to increase as the epidemics of obesity, diabetes, and metabolic syndrome continue to grow [141].

There is no global consensus to screen for NAFLD among patients with obesity [142–152]. Liver histology remains the gold standard for diagnosing NAFLD and staging fibrosis, but due to the invasive nature and significant cost, it is considered only for select individuals [142]. Methods to identify NAFLD remain vague [143].

BENEFITS AND HARMS

Data from two RCTs involving patients with BMI ≥25 kg/m^2 who were given GLP-1-RAs (liraglutide, semaglutide) were included in this review.

Treatment with liraglutide or semaglutide was associated with greater chances of histological resolution of NASH without worsening of liver fibrosis (RR 2.80 [95% CI 1.63, 4.81], I^2=0%) [153,154] (Table 29). The most common adverse events reported were nausea (37%), diarrhea (27%), and decreased appetite (23%). Compared to those in the placebo group, more patients who took liraglutide or semaglutide experienced diarrhea (RR 1.90 [95% CI 1.15, 3.12], I^2=0%) and decreased appetite (RR 4.24 [95% CI 1.88, 9.57], I^2=0%) (Table 29). However, the increased incidence of nausea was not statistically significant and there was substantial heterogeneity probably due to varying GLP-1-RAs and doses (I^2=81%).

The incidence of SAEs was not significantly increased in those given a GLP-1-RA. In the liraglutide group, 2 (7.7%) developed tuberculosis and migraine, both of which were deemed unrelated to treatment by the investigators [154]. In the semaglutide group, SAEs were observed in 12 (14.8%) patients who received 0.1 mg semaglutide, 15 (19.2%) patients who received 0.2 mg semaglutide, 12 (14.8%) patients who received 0.4 mg semaglutide, and 8 (10%) patients who received placebo [153]. The difference was not statistically significant and there was no dose-dependent relationship. The most common SAEs with semaglutide were gastrointestinal disorders (3.3%).

The effect of liraglutide and semaglutide on mortality among obese patients with NAFLD was inconclusive. One of the patients in the 0.2-mg semaglutide group died of sudden cardiac

death [153]. The patient had type 2 diabetes mellitus and established CVD, and the event was considered unlikely related to semaglutide by the investigators. No patients died during the 60-week study period of the liraglutide trial [154].

No studies examining cirrhosis, liver failure or liver cancer outcomes among obese patients with NAFLD using GLP-1-RAs were found. This is probably due to the relatively short follow-up periods in trials as it takes a follow-up of at least 7–14 years to detect differences in these clinical outcomes [155].

Table 29. Efficacy and safety of GLP-1 receptor agonists as linked management for non-alcoholic fatty liver disease/non-alcoholic steatohepatitis [153,154]

Outcomes	No. of Studies (No. of Participants)	RR [95% CI]	Interpretation	Certainty of Evidence
Resolution of NASH	2 RCTs (n=275)	2.80 [1.63, 4.81]	Benefit	Moderate
Mortality	2 RCTs (n=371)	1.01 [0.04, 24.61]	Inconclusive	Very low
Diarrhea	2 RCTs (n=371)	1.90 [1.15, 3.12]	Harm	Moderate
Decreased appetite	2 RCTs (n=371)	4.24 [1.88, 9.57]	Benefit	Moderate
SAEs	2 RCTs (n=371)	1.73 [0.86, 3.48]	Inconclusive	Moderate

CI confidence interval; NASH nonalcoholic steatohepatitis; RCT randomized controlled trial; RR risk ratio; SAE severe adverse event

DIAGNOSTIC PERFORMANCE

Based on data from seven observational studies on the diagnostic accuracy of liver ultrasound, the pooled sensitivity for liver ultrasound compared with liver biopsy was 84.9% (95% CI 65.3, 94.4; I^2=92.6%) and the pooled specificity was 48.6% (95% CI 24.7, 73.1; I^2=60.1%), with positive likelihood ratio of 1.65 and negative likelihood ratio of 0.31 [156–162] (Table 30). This means that a positive liver ultrasound for NAFLD would make the odds of a NAFLD diagnosis 1.65 times more likely while a negative liver ultrasound result would reduce the odds of NAFLD to about one-third.

Table 30. Diagnostic accuracy of liver ultrasound for non-alcoholic fatty liver disease [156–162]

Index test	No. of Studies (No. of Participants)	Estimate [95% CI]	LR	Interpretation	Certainty of Evidence
Liver ultrasound	7 OS (n=1,002)	Sn 84.9% [65.3, 94.4]	(+): 1.65 (-): 0.31	High	Very low
	7 OS (n=443)	Sp 48.6% [24.7, 73.1]		Moderate	Very low

CI confidence interval; LR likelihood ratio; OS observational study; Sn sensitivity; Sp specificity

COST IMPLICATION

No local cost-effectiveness studies were found on screening for NAFLD using a liver ultrasound. The costs for screening and treatment are summarized in Table 31.

Table 31. Costs of interventions for non-alcoholic fatty liver disease/non-alcoholic steatohepatitis*

Services/Products	Provider	Price
Hepatobiliary ultrasound	Batangas Medical Center	PHP 600.00
Liver ultrasound	San Lazaro Hospital	PHP 850.00
One organ ultrasound	East Avenue Medical Center	PHP 1,008.00
Liver ultrasound	New World Diagnostics	PHP 525.00
Liver ultrasound	De La Salle University Medical Center	PHP 1,325.00
Ultrasound-guided liver biopsy	Makati Medical Center	PHP 49,195.00–78,020.00
Liraglutide (Saxenda) 6 mg/mL,	Southstar Drug Store	PHP 104.80 (per day)

Services/Products	Provider	Price
3 mL pen		PHP 3,144.00 (per month)
Liraglutide (Victoza) 6 mg/mL, 3 mL pen	Southstar Drug Store	PHP 317.00 (per day) PHP 9,525.00 (per month)
Semaglutide (Ozempic) 0.5 mg SC	Southstar Drug Store	PHP 200.00 (per day) PHP 6,500.00 (per month)
Semaglutide (Ozempic) 1 mg SC	Southstar Drug Store	PHP 200.00 (per day) PHP 6,500.00 (per month)

*Costs as of the writing of this CPG

The locally available dose of liraglutide is the same as that used in the trial [154]. Cost ranges from PHP 104.80–317.00 per day. The locally available dose of semaglutide (0.5–1 mg SC once weekly) was different to the dose used in the trial (daily dose of semaglutide starting at 0.05 mg SC titrated every 4 weeks until 0.4 mg/day). Semaglutide costs PHP 200 per day (computation of which was based on locally available dose of 0.5–1 mg SC once weekly).

EQUITY, ACCEPTABILITY, AND FEASIBILITY

One retrospective study (n=385) showed that screening for NAFLD with ultrasound and liver enzymes following recommendations from the European Associations for the Study of the Liver, of Diabetes, and of Obesity among individuals with severe obesity (BMI ≥35 kg/m^2) led to an excessive number of specialist referrals (75.1%), which would lead to an unjustified increase in healthcare cost [163]. The increase in specialist referral, however, is likely the result of referrals due to elevated liver enzymes (45.7%), irrespective of ultrasound results. Specialist referral due to medium/high risk for fibrosis (i.e., steatosis present on ultrasound + normal liver enzymes + NAFLD fibrosis score of 2 or 3) was 29.4%.

RECOMMENDATIONS FROM OTHER GROUPS

Table 32. Recommendations from other guidelines, organizations, or societies on the assessment and management of non-alcoholic fatty liver disease/non-alcoholic steatohepatitis

Group (Year)	Recommendation	Strength of Recommendation/ Certainty of Evidence
AACE (2022) [144]	Clinicians **should consider** persons with obesity and/or features of metabolic syndrome, those with prediabetes or DM, and those with hepatic steatosis on any imaging study and/or persistently elevated plasma aminotransferase levels (over 6 months) to be “high risk” and screen for NAFLD and advanced fibrosis.	Strong; Intermediate/High
	Clinicians should use liver fibrosis prediction calculations to assess the risk of NAFLD with liver fibrosis. The preferred noninvasive initial test is the FIB-4.	Strong; Intermediate
	For chronic weight management in individuals with a BMI of >27 kg/m^2 and NAFLD or NASH, clinicians should give preference to semaglutide 2.4 mg/week (best evidence) or liraglutide 3 mg/day.	Strong; Intermediate/High
AGA (2021) [151]	Patients with 2 or more metabolic risk factors are **recommended** to undergo a 2-tier process to assess for clinically significant liver fibrosis (FIB-4 then LSM or liver biopsy).	N/A

Group (Year)	Recommendation	Strength of Recommendation/ Certainty of Evidence
ALEH (2020) [150]	NAFLD screening is **recommended** for patients with repeatedly altered liver enzymes, features of metabolic syndrome, or obesity (BMI > 30). Liver ultrasound is the most recommended technique as the first approach because of its wide availability, low-cost, and safety.	Delphi consensus
SCD (2019) [152]	Patients with risk factors (obesity, DM, dyslipidemia, hypertension, metabolic syndrome) **should be screened** for NAFLD with FLI. Steatosis screening is aimed at patients with risk factors for NAFLD and can be performed simply with the FLI. In case of having an ultrasound with steatosis, it would be an indication to continue with the algorithm and look for fibrosis data.	N/A
AASLD (2018) [149]	Routine Screening for NAFLD in high-risk groups attending primary care, diabetes, or obesity clinics is **not advised** at this time because of uncertainties surrounding diagnostic tests and treatment options, along with lack of knowledge related to long-term benefits and cost-effectiveness of screening.	N/A
AEEH (2018) [145]	The at-risk population (patients with obesity, DM or MetS) **should be screened** for NAFLD, with study of liver enzymes and ultrasound.	Strong; Moderate
	The development of GLP-1-RA has to be completed (in phase iii clinical trials) before evidence-based recommendations can be made.	Strong; High
Asia Pacific Working Party on NAFLD (2017) [147]	Screening of NAFLD **may be considered** in at risk groups such as patients with DM and obesity.	Weak; Moderate
	Ultrasonography is a reasonable screening tool for NAFLD, but will not detect many cases of minor steatosis.	Strong; Moderate
EASL, EASD and EASO (2016) [146]	Patients with IR and/or metabolic risk factors (*i.e.* obesity or MetS) **should undergo** diagnostic procedures for the diagnosis of NAFLD, which relies on the demonstration of excessive liver fat.	Strong; High
	In subjects with obesity or MetS, screening for NAFLD by liver enzymes and/or ultrasound should be part of routine work-up.	Weak; High
Chinese Society of Endocrinology (2013) [148]	Ultrasound examination-based screening for NAFLD in high-risk adults, especially those who attend diabetes or obesity clinics, **is advised.**	Strong; Moderate
	Ultrasonography is recommended as the currently most appropriate imaging modality for NAFLD screening. The safety of anti-obesity drugs remains to be determined.	Strong; High

AACE American Association of Clinical Endocrinology; AASLD American Association for the Study of Liver Diseases; AEEH Spanish Association for the Study of the Liver; AGA American Gastroenterological Association; ALEH Latin American Association for the study of the liver; BMI body mass index; CPG clinical practice guidelines; DM diabetes mellitus; EASD European Association for the Study of Diabetes; EASL European Association for the Study of the Liver; EASO European Association for the Study of Obesity; LMS liver stiffness measurement; MeTS metabolic syndrome; NAFLD nonalcoholic fatty liver disease; NASH nonalcoholic steatohepatitis; SCD Catalan Society of Gastroenterology

Should we screen for obstructive sleep apnea using STOP-Bang score among adult Filipinos with obesity?

Among adult Filipinos with obesity, we <u>suggest screening</u> for obstructive sleep apnea using the STOP-BANG questionnaire once a year. (Very low certainty of evidence, Weak recommendation)

NOTE: consider polysomnography when STOP-BANG score ≥3

CONSENSUS ISSUES

The Consensus Panel voted for a weak recommendation on screening for OSA using the STOP-BANG questionnaire. Although STOP-BANG would be easy to implement, training may still be needed to prepare healthcare providers to implement the tool. The frequency of screening may be adjusted depending on the presence of risk factors for OSA; the Panel acknowledges that it is possible for symptoms to resolve between STOP-BANG assessments.

KEY FINDINGS

There is no direct evidence on screening for OSA using STOP-BANG among adults with obesity. Pooled results of diagnostic accuracy studies (n=28,644) show that STOP-BANG is highly sensitive (91.3% [95% CI 88.6, 93.4]; I^2=95.4%) but had low specificity (36.0% [95% CI 28.3, 44.5]; I^2=91.7%). There was high variability between the pooled studies, which is likely due to differences in the comparator used and in the characteristics of the study population.

Treatment of OSA with continuous positive airway pressure (CPAP) showed improved quality of life among individuals with obesity and diabetes mellitus (adjusted MD -4.6 [95% CI -9.0, -0.1]) and higher BMI (WMD 0.148 kg/m^2 [95% CI 0.04, 0.26]), but unclear benefits for other outcomes. The overall certainty of evidence is very low because of indirect evidence on linked treatment with OSA, imprecision and significant heterogeneity.

BURDEN OF DISEASE

OSA is an important condition that is commonly associated with obesity. It refers to a recurrent form of upper airway obstruction resulting in sleep disturbance, agitation, and episodic oxygen desaturation especially during sleep [164]. Obesity is considered to be the most common predisposing factor for OSA, with about a tenfold increase in acquiring OSA among individuals with a BMI of >30 kg/m^2 [165]. The burden of OSA, especially among persons with obesity, is palpable. In a cross-sectional study featuring Asian patients with obesity who are candidates for bariatric surgery, the prevalence of OSA was as high as 80.5% [166].

There are several tools available to screen for OSA, and the most commonly used are the Epworth Sleepiness scale, the Berlin questionnaire, and the STOP-BANG questionnaire. The STOP-BANG questionnaire (Appendix 4) is a validated screening tool for OSA that screens for snoring, tiredness, observed apnea, blood pressure or the presence of hypertension, BMI >35 kg/m^2, age >50 years, neck circumference >40 cm, gender (male). A score of 3 is generally employed to detect all forms of OSA [167]. A study conducted by Arslan and colleagues in 2020 found that STOP-BANG demonstrated the highest sensitivity for detecting high-risk patients for OSA [168].

BENEFITS AND HARMS

One open-label RCT explored the effect of CPAP compared with conventional treatment among persons with obesity and diabetes mellitus on health-related quality of life [169]. This RCT demonstrated that after 6 months, patients treated with CPAP had a significantly better satisfaction with the treatment domain of the Diabetes Quality of Life questionnaire compared to patients on the conventional treatment arm, with an intergroup adjusted difference of -4.6 (95% CI -9.0, -0.1) (Table 33). Evidence on linked management also showed that combined management of CPAP with weight loss led to a significant reduction in blood pressure (WMD -8.89 mm Hg [95% CI CI -13.67, -4.1]) compared to CPAP alone [170]. When CPAP coupled with weight loss intervention was compared to weight loss intervention alone for adult patients with OSA and obesity, results showed a decrease in systolic blood pressure, favoring the combined therapy (WMD -3.88 mmHg [95% CI -7.78, 0.02]).

However, the benefit of CPAP on diabetes, weight loss, cardiovascular disease, and cerebrovascular disease is inconclusive. A meta-analysis done by the reviewers of seven RCTs involving a total of 265 patients treated with CPAP and 300 patients treated with usual care revealed that CPAP therapy did not significantly reduce HbA1c levels in patients with diabetes mellitus [169,171–176]. In a meta-analysis of 39 RCTs (n=6,954), it was found that BMI increased after initiation of CPAP therapy (WMD 0.148 kg/m^2 [95% CI 0.04, 0.26]; p=0.001), but subgroup analysis revealed that patients who exhibited an increase in BMI were those without CVD at baseline, those with dysglycemia, and those who used CPAP for only ≤5 hours a night. [177]. Among those with CVD, CPAP decreased BMI (WMD -0.188 [95% CI -0.299, -0.078]). Pooled data from eight RCTs (n=5,817) also failed to provide evidence that CPAP could reduce the number of major adverse cardiovascular events (MACEs) or stroke events [178]. The relatively short follow-up period in the included studies may have contributed to the lack of significant event seen.

There were no adverse outcomes associated with screening for OSA using the STOP-BANG questionnaire reported across all the studies reviewed. the certainty of evidence was downgraded due to indirectness, heterogeneity (different populations and comparators, varying adherence) and wide confidence intervals of the effect estimates.

Table 33. Efficacy of continuous positive airway pressure therapy on obstructive sleep apnea

Outcomes [Unit]	No. of Studies (No. of Participants)	Effect Estimate [95% CI]	Interpretation	Certainty of Evidence
QOL	1 RCT (n= 50) [169]	Adjusted MD -4.6 [-9.0, -0.1]	Benefit	Low
DM	7 RCTs (n=565) [169,171–176]	SMD -0.10 [-0.41, 0.20]	Inconclusive	Low
Weight change [kg/m^2]	39 RCTs (n=6,954) [177]	WMD 0.148 [0.04, 0.26]	Harm	Very low
CV events	8 RCTs (n=5,817) [178]	RR 0.87 [0.70, 1.10]	Inconclusive	Very low
Cerebrovascular disease	8 RCTs (n=5,817) [178]	RR 0.94 [0.71, 1.26]	Inconclusive	Very low
Change in SBP [mmHg]	8 RCTs (n=2,627) [170]	WMD -3.88 [-7.78, 0.02]	As good as or better	Low

CI confidence interval; CV cardiovascular; DM diabetes mellitus; MD mean difference; QOL quality of life; RCT randomized controlled trial; RR risk ratio; SBP systolic blood pressure; SMD standardized mean difference; WMD weighted mean difference

DIAGNOSTIC PERFORMANCE

Data from a systematic review of cohort studies from different regions worldwide that investigated the diagnostic accuracy of STOP-BANG, as well as from six additional cohort studies, were included in this review. Pooled results show that STOP-BANG as a screening tool has a sensitivity of 91.3% (95% CI 88.6%, 93.4%) and specificity of 36.0% (95% CI 28.3%, 44.5%) [167,179–184] (Table 34). Heterogeneity was significant for both sensitivity (p<0.0001, I^2=95.4%) and specificity (p<0.0001, I^2= 91.7%). Differences in the comparator used for the STOP-BANG questionnaire could be a source of variation. For instance, some studies utilized polysomnography (apnea-hypopnea index), while other studies used home sleep apnea testing as the comparator or the diagnostic reference standard. The differences in the characteristics of the study populations (ex. presence of co-morbidities) are another driver of the significant heterogeneity observed.

Table 34. Diagnostic accuracy of STOP-BANG questionnaire for obstructive sleep apnea [167,179–184]

Index test	No. of Studies (No. of Participants)	Estimate [95% CI]	LR	Interpretation	Certainty of Evidence
STOP-BANG	51 cohort studies (n=28,644)	Sn 91.3% [88.6, 93.4]	(+): 1.43 (-): 0.24	High	Moderate
		Sp 36.0% [28.3, 44.5]		Low	Low

CI confidence interval; LR likelihood ratio; Sn sensitivity; Sp specificity

The certainty of evidence for the pooled sensitivity is moderate while the certainty of evidence for the pooled specificity is low. Downgrading was done due to inconsistent results and wide confidence intervals among some of the studies included, as well as marked heterogeneity.

COST IMPLICATION

Studies are needed to determine the cost-effectiveness of the STOP-BANG questionnaire for screening in the local setting, but minimal cost is expected for this screening strategy. Treatment for OSA in the form of CPAP ranges from PHP 50,000.00–100,000.00*.

*Costs as of the writing of this CPG

EQUITY, ACCEPTABILITY, AND FEASIBILITY

There are currently no studies investigating the feasibility and acceptability of routine screening for OSA among persons with obesity.

RECOMMENDATIONS FROM OTHER GROUPS

Table 35. Recommendations from other guidelines, organizations, or societies on the assessment of obstructive sleep apnea

Group (Year)	Recommendation	Strength of Recommendation/ Certainty of Evidence
AACE/ACE (2016) [13]	All patients with overweight or obesity should be evaluated for **OSA** during medical history and physical examination; this is based on the strong association of these disorders with each other.	Intermediate
USPSTF (2017) [185]	For adults ≥18 years who do not have signs or symptoms of OSA**, t**he USPSTF found that the current evidence is insufficient to assess the balance of benefits and harms of screening for OSA.	Weak

AACE American Association of Clinical Endocrinology; ACE American College of Endocrinology; OSA obstructive sleep apnea; USPSTF US Preventive Services Task Force

Should we screen for depression among adult Filipinos with obesity?

Among adult Filipinos with obesity, we recommend screening for depression using the Patient Health Questionnaire-9 tool every 6 months. (Very low certainty of evidence, Strong recommendation)

NOTE: consider referral to a psychiatrist when PHQ-9 score ≥10

CONSENSUS ISSUES

Despite the very low certainty of evidence, the panelists voted for a strong recommendation due to the following considerations:

- The prevalence of depression has increased in recent years.
- The Patient Health Questionnaire-9 (PHQ-9) is a simple, accurate, and accessible questionnaire that can be self-administered.
- Screening for depression is further supported by the Mental Health Act (RA 11036).
- Aside from antidepressants, psychological interventions such as psychotherapy and lifestyle modification may be implemented among individuals with symptoms of depression.

The panelists also acknowledge the challenges of implementing a nationwide screening program.

- There may not be enough psychiatrists in the Philippines to manage a continued uptick of cases with depression. However, primary care providers may assist in the initial management of depression.
- Training is needed for primary care providers to ensure that the PHQ-9 will be administered in a sensitive and empathetic manner.
- A Filipino version of the PHQ-9 is available but has only been validated among migrant Filipinos.

KEY FINDINGS

No direct evidence was found on the impact of screening for depression among Filipinos with obesity. Indirect evidence came from one diagnostic cross-sectional study on the PHQ-9 and one RCT on a comprehensive behavioral intervention among adults with obesity. PHQ-9 had a sensitivity of 87.8% (95% CI 74.5, 94.7) and a specificity of 87.9% (95% CI 84.9, 90.4) when compared to a diagnosis of major depression by a mental health professional.

A 12-month intervention including problem-solving strategies and as-needed antidepressants resulted in more participants with weight loss ≥5% from baseline (RR 1.85 [95% CI 1.21, 2.83]) and improved obesity-specific quality of life (MD -4.7 [95% CI -9.8, 0.3]). Lower BMI was also associated with improved obesity-specific quality of life, after adjusting for age, sex, treatment group assignment, and baseline value (β 0.01 [95% CI 0.01, 0.02]). There was no significant difference in adverse events in the intervention and control groups.

BURDEN OF DISEASE

Obesity and depression are frequently co-occurring and highly prevalent conditions, with 40% of U.S. adults classified as obese and 21% who suffer from depression at least once in their lifetime [186]. In the Philippines, it is estimated that about 27 million Filipinos (~36.6%) are obese [4].

The causal relationship between obesity and depression is complex. A recent meta-analysis found that obesity increased the risk for depression and that depression increased the odds of developing obesity. Literature also suggests that obesity is a risk factor for depression and that these comorbidities are risk factors for a bad prognosis illness [187]. Body image dissatisfaction, as well as weight and shape concerns, were found to contribute to depression among obese patients [188]. In addition, mental health disorders and inflammation could also be potentially involved in 'visceral adipose tissue' (fatty tissues around major abdominal organs), which could lead to altered hormonal levels among other detrimental health effects [189].

Depression has also been shown to interfere with weight loss. Patients with obesity and untreated depression lost less weight during weight loss treatment, while patients who recovered from depression had weight loss success equal to that of those who were not depressed [190]. In addition, obesity and depression carry an increased risk of CVD [191]. Individuals with both obesity and depression report poorer health-related quality of life than those with only either or neither condition [192].

The PHQ-9 (Appendix 4) is a three-page questionnaire that scores each of the nine DSM-IV criteria for depression from "0" (not at all) to "3" (nearly every day). It could be used for screening, diagnosis, and monitoring of the condition. Major depression rarely occurs among PHQ-9 scores <10 and is frequently seen with scores of ≥15 [193]. The recent Philippine Guidelines on Periodic Health Examination (PHEX) recommended screening apparently healthy adults for depression using the PHQ-9 twice a year [194]. A Filipino version of the PHQ-9 was translated by the Mapi Research Institute from Pfizer, Inc. and was recently validated in a study on Filipino migrant domestic workers in Macao.

BENEFITS AND HARMS

Two RCTs were included in this review. In one study, the effect of an integrated collaborative care intervention for adults with both obesity and depression was investigated in comparison with usual medical care. Data on obesity-specific quality of life was included from the other study.

After 12 months, almost twice as many participants in the I-CARE group achieved weight loss of ≥ 5% from baseline compared to the usual care group (RR 1.85 [95% CI 1.21, 2.83]) [195] (Table 36). Participants who received the problem-solving and weight loss intervention had lower scores on the Obesity-Related Problems Scale at the 12-month follow-up (mean 54.3 [SD 25.9] vs. 56.1 [SD 27.2]) [196]. The intervention group scored 4.7 points lower, on average, compared to the usual care group (MD -4.7 [95% CI -9.8, 0.3]). Lower BMI was also associated with improvement in the obesity related problems scale after adjusting for age, sex, treatment group assignment and baseline value (β 0.01 [95% CI 0.01, 0.02]). There was no significant difference in the incidence of SAEs between the I-CARE and usual care group (RR 0.96 [95% CI 0.48, 1.88]) [195]. Thirteen participants required hospitalization and 10 involved musculoskeletal injuries needing outpatient procedures. No mortalities occurred during follow-up.

Table 36. Efficacy and safety of integrated collaborative behavioral intervention in participants with overweight and obesity on depression-related outcomes

Outcomes	No. of Studies (No. of Participants)	Effect estimate [95% CI]	Interpretation	Certainty of Evidence
Weight loss ≥5%	1 RCT (n=400) [195]	RR 1.85 [1.21, 2.83]	Benefit	Low
QOL*	1 RCT (n=317) [196]	MD -4.7 [-9.8, 0.3]	As good as or better	Very Low
SAEs	1 RCT (n=400) [195]	RR 0.96 [0.48, 1.88]	Inconclusive	Very Low

CI confidence interval; MD mean difference; QOL quality of life; RCT randomized controlled trial; RR risk ratio; SAE serious adverse event
*Obesity-Related Problem Scale 0–100, higher scores indicate more problem

DIAGNOSTIC PERFORMANCE

An RCT among respondents who did not have obesity was included for this outcome. The respondents were asked to complete the PHQ-9 questionnaire and undergo a validation interview with a mental health professional, which were compared with the reference standard (diagnosis of major depression by a mental health professional). Using a cut-off score of 10, the PHQ-9 tool had high sensitivity (87.8% [95% CI 74.5, 94.7]) and specificity (87.9% [95% CI 84.9, 90.4]) for major depression compared to an interview with a mental health professional [193] (Table 37). A score of PHQ-9 <10 reduces the odds of depression by 86%, while a score of ≥10 increases the odds of depression sevenfold.

Table 37. Diagnostic accuracy of the Patient Health Questionnaire-9 for major depression [193]

Index test	No. of Studies (No. of Participants)	Estimate [95% CI]	LR	Interpretation	Certainty of Evidence
PHQ-9*	1 XS (n=580)	Sn 87.8% [74.5, 94.7]	(+): 7.28 (-): 0.14	Low	Moderate
		Sp 87.9% [84.9, 90.4]		Moderate	Moderate

CI confidence interval; LR likelihood ratio; PHQ-9 Patient Health Questionnaire; Sn sensitivity; Sp specificity; XS cross-sectional study
*Comparator: diagnosis by a mental health professional

COST IMPLICATION

There were no local cost-effectiveness studies on the use of PHQ-9 among Filipino patients with overweight or obesity, but distribution of the screening tool is expected to incur minimal costs.

An international study aimed to estimate the incremental cost-effectiveness of screening followed by collaborative care, reporting that over the average lifespan of a 20-year-old residing in New York City, the incremental cost-effectiveness of these interventions was about USD 1,726.00 per quality-adjusted life-year (QALY) gained (95% plausible interval: cost-saving, USD 10,594/QALY gained) [197].

EQUITY, ACCEPTABILITY, AND FEASIBILITY

The recent PHEX Guideline on Screening of Asymptomatic Individuals recommended screening for depression among asymptomatic, apparently healthy individuals using PHQ-9 [194]. The guideline concluded that the tool was equitable, acceptable, and feasible, but that accessibility to depression management should be improved.

RECOMMENDATIONS FROM OTHER GROUPS

Table 38. Recommendations from other guidelines, organizations, or societies on the assessment of depression and/or overweight/obesity

Group (Year)	Recommendation	Strength of Recommendation/ Certainty of Evidence
AACE/ACE (2016) [13]	Patients with overweight or obesity should be screened for depression; all patients with depression should be evaluated for the presence of overweight or obesity	Grade B; BEL 2

AACE American Academy of Clinical Endocrinologists; ACE American College of Endocrinology

Should we screen for osteoarthritis among adult Filipinos with obesity?

Among adult Filipinos with obesity, we recommend screening for osteoarthritis using the American College of Radiology clinical classification criteria at every visit. (Very low certainty of evidence, Strong recommendation)

CONSENSUS ISSUES

Despite the very low certainty of evidence, the Consensus Panel agreed upon a strong recommendation for screening of osteoarthritis using the American College of Radiology (ACR) clinical classification criteria due to the following considerations:

- Weight and obesity are often considered in the assessment of patients for osteoarthritis.
- Screening with the ACR criteria is easy to implement and can be provided at little to no cost.
- There are significant, positive long-term impacts with early detection and intervention for osteoarthritis including increased productivity and decreased work absences.
- Screening may also raise awareness among patients regarding the role of weight gain and obesity in causing osteoarthritis.

KEY FINDINGS

There was no direct evidence on screening for knee osteoarthritis among persons with obesity. Evidence from a cross-sectional study on the diagnostic accuracy of the ACR criteria showed that the criteria had moderate specificity (76.8% [95% CI 70.1, 82.4]) but lower sensitivity (39.1% [95% CI 31.2, 47.6]) against a combination of symptoms and knee radiograph when used to detect knee osteoarthritis among adults with BMI ≥30 kg/m^2.

In a meta-analysis of five RCTs on weight loss interventions among patients with overweight or obesity, interventions that resulted in weight loss >5% led to a significant reduction in pain (SMD 0.33 [95% CI 0.17, 0.48]), self-reported disability (SMD 0.42 [95% CI 0.25, 0.59]), and physical quality of life (SMD 0.39 [95% CI 0.24, 0.54]). The overall certainty of evidence is low due to indirect evidence, issues on allocation concealment and blinding, as well as imprecision.

BURDEN OF DISEASE

Osteoarthritis is a heterogenous group of conditions that results in the loss of integrity of the articular cartilages of the joints. It is a leading cause of pain, disability, and loss of productivity. As of 1997, about 4% of adults in an urban community in Metro Manila had osteoarthritis based on the ACR criteria [198]. There is no gold standard in the diagnosis of osteoarthritis, but clinicians may base their diagnosis on the presence of symptoms and pathology. An X-ray and the Kellgren Lawrence grading system are often used for the radiographic diagnosis of osteoarthritis, while clinical classification criteria may be used to diagnose osteoarthritis in the absence of imaging [199,200]. The most commonly used clinical classification criteria for knee osteoarthritis are the ACR criteria (Table 39).

Table 39. The American College of Radiology clinical classification criteria for knee osteoarthritis [201]

Method	Criteria
Using history & physical examination[a]	*Knee pain + any 3 of the following:* • >50 years of age • <30 minutes of morning stiffness • Crepitus on active motion • Bony tenderness • Bony enlargement • No palpable warmth of synovium
Using history, physical examination, & radiographic findings	*Knee pain + any 1 of the following:* • >50 years of age • <30 minutes of morning stiffness • Crepitus on active motion and osteophytes
Using history, physical examination, & laboratory findings	*Knee pain + any 5 of the following:* • >50 years of age • <30 minutes of morning stiffness • Crepitus on active motion • Bony tenderness • Bony enlargement • No palpable warmth of synovium • ESR < 40mm/hour • RF < 1:40 • SF signs of osteoarthritis

[a]The ACR criteria may be applied through different assessment methods, but the current CPG focuses on using the criteria through history and physical examination.

BENEFITS AND HARMS

A meta-analysis of RCTs that investigated the effect of weight loss interventions compared to usual care on the outcomes pain improvement, self-reported disability, and quality of life among adults with obesity (mean BMI range: 33.6–36.4 kg/m^2) was included [202]. Interventions resulting in >5% weight loss led to a greater decrease in pain score (SMD 0.33 [95% CI 0.17, 0.48]; I^2=0%) on the Western Ontario and McMaster Universities Arthritis Index scale among patients with obesity and knee osteoarthritis (Table 40). Similarly, weight loss interventions resulted in greater improvement in self-reported disability (SMD 0.42 [95% CI 0.25, 0.59]; I^2=0%) and physical quality of life (SMD 0.39 [95% CI 0.24, 0.54]). Meanwhile, there was no significant effect on the mental component of quality of life. The certainty of evidence for efficacy outcomes was downgraded due to indirectness and issues on allocation concealment and blinding given subjectively reported outcomes.

Table 40. Efficacy of weight loss interventions in patients with overweight or obesity on osteoarthritis-related outcomes [202]

Outcomes	No. of Studies (No. of Participants)	SMD [95% CI]	Interpretation	Certainty of Evidence
Pain improvement[a]	5 RCTs (n=676)	0.33 [0.17, 0.48]	Benefit	Low
Self-reported disability[b]	5 RCTs (n=534)	0.42 [0.25, 0.59]	Benefit	Low
QOL (physical)	5 RCTs (n=693)	0.39 [0.24, 0.54]	Benefit	Low
QOL (mental)	3 RCTs (n=475)	0.04 [-0.14, 0.22]	Equivalent	Low

CI confidence interval; QOL quality of life; RCT randomized controlled trial; SMD standardized mean difference
[a] WOMAC (Western Ontario and McMaster Universities Arthritis Index) pain scale; range 0–20 with higher scores indicating more severe pain
[b] WOMAC function scale

DIAGNOSTIC PERFORMANCE

Based on data from a cross-sectional study, the ACR clinical classification criteria had moderate specificity (76.8% [95% CI 70.1, 82.4]) but lower sensitivity (39.1% [95% CI 31.2, 47.6]) when compared with a combination of symptoms and knee radiograph among adults with BMI ≥30 kg/m^2 [203] (Table 41). Meeting the ACR criteria increased the odds of having osteoarthritis by 69%, while a negative result lowered the odds by 21%. The certainty of evidence was downgraded to moderate because of an imprecise estimate for specificity.

Table 41. Diagnostic accuracy of the American College of Rheumatology clinical classification criteria for knee osteoarthritis among adults with BMI ≥30 kg/m^2 [203]

Index test	No. of Studies (No. of Participants)	Estimate [95% CI]	LR	Interpretation	Certainty of Evidence
ACR Criteria[a]	1 XS (n=310)	Sn 39.1% [31.2, 47.6]	(+): 1.69	Low	Moderate
		Sp 76.8% [70.1, 82.4]	(-): 0.79	Moderate	High

ACR American College of Rheumatology; CI confidence interval; LR likelihood ratio; Sn sensitivity; Sp specificity; XS cross-sectional study

[a] Comparator: symptoms + knee radiograph

COST IMPLICATION

There is minimal direct cost involved in screening for knee osteoarthritis utilizing clinical criteria.

EQUITY, ACCEPTABILITY, AND FEASIBILITY

No studies investigating the feasibility and acceptability of routine screening for knee osteoarthritis among persons with obesity were found.

RECOMMENDATIONS FROM OTHER GROUPS

Table 42. Recommendations from other guidelines, organizations, or societies on the assessment of osteoarthritis

Group (Year)	Recommendation	Strength of Recommendation/ Certainty of Evidence
AACE/ACE (2016) [204]	All patients with overweight or obesity should be screened by symptom assessment and physical examination for OA of the knee and other weight-bearing joints.	Moderate

AACE American Association of Clinical Endocrinologists; ACE American College of Endocrinology; OA osteoarthritis

Should we screen for medications associated with weight gain among adult Filipinos with obesity?

Among adult Filipinos with obesity, we recommend screening for the use of obesogenic medications for other health conditions at every visit. (Low certainty of evidence, Strong recommendation)

CONSENSUS ISSUES

Despite the low certainty of evidence, the Consensus Panel voted for a strong recommendation for screening for obesogenic medications because of the following considerations:

- Screening would incur minimal to no undesirable effects, low to no costs, would be acceptable and feasible, and would promote equity among adult Filipinos with obesity.
- Screening would provide an opportunity for healthcare practitioners to promote other interventions for weight loss, and would help inform management decisions, particularly among those who want to achieve weight loss.

KEY FINDINGS

No direct evidence on the effect of screening for weight gain-associated medications was found. Instead, two RCTs provided indirect evidence on linked management for weight loss among patients with obesity being treated with obesogenic medications for an underlying disease. Patients treated with a non-pharmacologic intervention (i.e., lifestyle modification) for diabetes mellitus had increased odds of achieving total weight loss ≥5% (OR 14.92 [95% CI 12.61, 17.23]) after adjusting for race/ethnicity, baseline BMI, presence of hypertension, Beck depression inventory score and obesogenic medication. Likewise, patients treated with a pharmacologic intervention for hypertension (i.e., metformin) experienced greater weight loss (MD -1.10 kg [95% CI -2.10, -0.10]) and greater decreases in BMI (MD -0.48 kg/m^2 [95% CI -0.89, -0.07]). The overall certainty of evidence is low because of high risk of bias due to non-blinding and indirectness.

BURDEN OF DISEASE

Obesogenic medications are pharmacologic therapies associated with an increased risk of unintentional weight gain. Intake of obesogenic medications can affect weight gain through decreased metabolic rate, adverse metabolic effects on lipids and/or insulin sensitivity, increased appetite, or increased fluid retention [205]. These potential adverse effects can result in poor medication adherence and the subsequent worsening of health outcomes. However, the early identification of the use of medications that cause weight gain may lead to the use of more weight-neutral alternatives to avoid unwanted weight-related complications [11,206].

A list of obesogenic medications can be found in Table 43.

Table 43. Examples of medications classified according to their effects on weight [205]

Medication Class	Weight Gain	Weight Neutral/ Less Weight Gain	Weight Loss
Antidepressants	lithium, MAOIs, SNRIs, SSRIs (paroxetine), TCAs (amitriptyline, doxepine, imipramine, nortiptyline)	SSRIs (fluoxetine, sertraline)	bupropion
Antipsychotics	clozapine, olanzapine, quetiapine, risperidone	aripiprazole, lurasidone, ziprasidone	-
Antiepileptics	carbamazepine, gabapentine, pregabalin, valproic acid	lamotrigine, levetiracetam, phenytoin	topiramate, zonisamide
Antihypertensives	α-adrenergic blockers, B-adrenergic blockers (atenolol, metoprolol, nadolol, propranolol)	ACE inhibitors, ARBs, B-adrenergic blockers (carvedilol, nebivolol), CCBs, thiazides	-
Antidiabetics	insulin, meglitinides, sulfonylureas, thiazolidinediones	α-glucosidase inhibitors, bromocriptine, colesevelam, DPP-4 inhibitors	GLP-1 agonists, metformin, pramlintide, SGLT2 inhibitors

ACE angiotensin-converting enzyme; ARB angiotensin receptor blocker; CCB calcium channel blocker; DPP-4 dipeptidul peptidase IV; GLP-1 glucagon-like peptide-1; MAOI monoamine oxidase inhibitor; SGLT2 sodium-glucose cotransporter-2; SNRI serotonin and norepinephrine reuptake inhibitor; SSRI selective serotonin reuptake inhibitor

BENEFITS AND HARMS

Two RCTs among patients with BMI ≥25 kg/m^2 being treated with obesogenic medications for an underlying disease were included. In one RCT, patients with diabetes mellitus were treated with at least one obesogenic anti-diabetic medication along with either a non-pharmacologic intervention (i.e., lifestyle modification) or standard of care for diabetes (n=3,199) [207]. The trial investigated the effect of non-pharmacologic intervention on total weight loss ≥5% (adjusting for race/ethnicity, baseline BMI, presence of hypertension, Beck depression inventory score and obesogenic medication). The other RCT included adults diagnosed with hypertension being treated with an obesogenic anti-hypertensive medication (i.e., metformin; n=94) [208]. The study aimed to examine the effect of a pharmacologic intervention in changing actual body weight and BMI after 1 year of treatment.

Findings on an RCT that compared non-pharmacological intervention and standard of care among patients being treated with an obesogenic drug for diabetes showed that the odds of having total weight loss ≥5% among those who underwent lifestyle modification was 15 times higher than that of the comparison group (adjusted OR 14.92 [95% CI 12.61, 17.23]) (Table 44) [207] (Table 44). In another study, treatment with metformin was associated with

significantly higher weight loss (MD -1.10 kg [95% CI -2.10, -0.10]) and a significantly larger decrease in BMI than those without intervention (MD -0.48 kg/m^2 [95% CI -0.89, -0.07]).

The overall certainty of evidence for the efficacy outcomes is low due to risk of bias from non-blinding, and indirectness.

Table 44. Efficacy of pharmacologic and non-pharmacologic interventions compared with no intervention for patients with obesity taking obesogenic medications

Outcomes (Duration of follow-up)	No. of Studies (No. of Participants)	Effect Estimate [95% CI]	Interpretation	Certainty of Evidence
Total weight loss ≥5% (1 yr)	1 RCT (n=3,199) [207]	OR 14.92 [12.61, 17.23]	Benefit	Low
Change in body weight, in kg (1 yr)	1 RCT (n=94) [208]	MD -1.10 [-2.10, -0.10]	Benefit	Low
Change in BMI, in kg/m^2 (1 yr)	1 RCT (n=94) [208]	MD -0.48 [-0.89, -0.07]	Benefit	Low

BMI body mass index; CI confidence interval; MD mean difference; OR odds ratio; RCT randomized controlled trial

DIAGNOSTIC PERFORMANCE

Screening through taking a patient's clinical history is considered an acceptable reference standard in determining the intake of obesogenic medications.

COST IMPLICATION

There is no cost for doctors and patients to screen for the use of obesogenic medications by history-taking.

EQUITY, ACCEPTABILITY, AND FEASIBILITY

There were no studies found discussing patient's values and preferences, including stigma, social impact, or other perspectives regarding screening for use of obesogenic medications.

RECOMMENDATIONS FROM OTHER GROUPS

Table 45. Recommendations from other guidelines, organizations, or societies on obesogenic medications

Group (Year)	Recommendation	Strength of Recommendation/ Certainty of Evidence
CMA (2020) [25]	For people living with overweight or obesity who require pharmacotherapy for other health conditions, we suggest choosing drugs that are not associated with weight gain	Level IV, Grade D

CMA Canadian Medical Association

The above recommendation was also adapted by the CPGs of Ireland and Chile [209,210].

Applicability Issues

Organizational considerations to implementation

The capacity for laboratory testing (i.e., TSH, OGTT) and imaging (i.e., ultrasound) may vary at the regional, provincial, and municipal level, which may present challenges for nationwide implementation of the CPG. However, the remaining screening tools could be readily provided at minimal to no cost since screening would involve either the use of questionnaires, history-taking, physical exams, or low-cost tools such as a tape measure. Healthcare providers must be trained to ensure that an assessment would be performed correctly to yield accurate results. Some materials such as a sphygmomanometer are already available in most facilities, but an investment in larger-sized cuffs may be needed to accommodate adults with obesity.

The availability of treatment for the conditions covered in this CPG may also present as a limitation. Certain medications may vary in availability at different levels of the health system. For some interventions (e.g., bariatric surgery, behavioral therapy, or intensive lifestyle modification), there may not be enough specialists to facilitate management if screening would result in a significant increase in cases. However, although the CPG explored the effectiveness of various treatment options from medication to surgical interventions, the first-line treatment for all conditions covered would be in the form of lifestyle interventions that may be advised even at the level of primary care.

Resource implications

The cost of screening tests and linked interventions were important considerations during the Consensus Panel meetings, although data was limited on the cost-effectiveness of these interventions at the local setting. Health technology assessment is vital to ensuring that the investments the government will make to implement this CPG will be cost-effective.

Monitoring and Evaluation

Dissemination

The final CPG manuscript will be submitted to the National Practice Guideline Clearinghouse of the DOH for review and approval prior to dissemination. Electronic copies of the evidence base and the final manuscript will be available through the DOH, VSMMC and the organizations involved in the CPG development. These institutions are also responsible for promoting the use and uptake of these recommendations across the Philippines to other possible stakeholders through publications, lectures, and other forms of notifications.

Dissemination to Industry Partners, Regulatory Agencies, and Payors
The Disease Prevention and Control Bureau of DOH will distribute copies of this CPG to the PHIC, health maintenance organizations, and pharmaceutical industry partners. The DOH will release a memorandum to notify all stakeholders of the publication.

Dissemination to Medical Societies and Training Institutions
This CPG will be presented during conferences and annual conventions of medical societies and other public health forums. Electronic copies of this CPG with the endorsement of relevant medical institutions will be sent to medical schools and libraries to integrate the recommendations in their training curricula, with the support of the faculty members and heads of hospital-based departments, including but not limited to surgery, radiology, pathology, and internal medicine.

Dissemination to Patients and Public in General
A simplified version of this CPG will be developed by the Obesity CPG Task Force, headed by the Steering Committee, for reproduction and dissemination to patients in clinics and hospitals.

Implementation

Based on the results of the guideline development process, significant changes to policy related to the diagnosis and management of obesity and its related conditions may be needed. One such change is the lowering of cutoffs for the diagnosis of obesity, which is due to the higher risk of diabetes, dyslipidemia, and hypertension among Filipinos at smaller values. Adopting these recommended cutoff values would facilitate the screening and early identification of Filipinos who have higher risks of CVD and related conditions, as well as enable healthcare providers to institute the appropriate early preventive and therapeutic interventions for Filipino adults. The guideline recommendations would also make workup of comorbid conditions more directed and cost-effective. This will hopefully lead to decreased government spending on treatment and rehabilitation of people with obesity-related complications.

The Obesity CPG Task Force will distribute a questionnaire annually to determine the best practices of relevant stakeholders in the screening, diagnosis, and management of the risk factors and conditions of individuals with overweight or obesity. Monitoring the use of this CPG may also be a subject of research by interested parties. For monitoring and auditing, the Task Force will use the final strength of recommendation to determine key performance indicators. Recommendations qualified as “strong” will be used as indicators.

Updating of the guidelines

The recommendations of this CPG shall hold until such time that new evidence on screening strategies or diagnostic tests for overweight and obesity emerges or other contingencies compel the updating of this CPG. The Obesity CPG Task Force intends to review this CPG no later than 2026. There is currently a separate plan to develop a CPG dedicated to the treatment and follow-up of obesity among Filipino adults.

Research Implications/Gaps

This guideline was based on primarily low- to very low-certainty evidence. For most of the screening questions, there was limited direct evidence on the benefits and harms of screening for the included obesity-related risk factors and conditions. Hence, there is a need for more high-quality studies assessing the effectiveness, safety, and diagnostic accuracy of screening on local populations with obesity.

Although data on costs for the screening strategy and related interventions were available, these studies on cost-effectiveness were from other countries and evidence was found for select review questions: PCOS, dysglycemia, dyslipidemia, and depression. There were no local cost-effectiveness studies found for any of the screening interventions covered in this guideline.

Future research is also needed to substantiate evidence on patient values and preferences, and on the equity, feasibility, and acceptability of screening among individuals with overweight or obesity for the risk factors and conditions included in this guideline. Only half of the screening questions had evidence for any of these considerations, and most of these studies were done among non-Filipino participants.

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Appendices

Appendix 1. Members of the CPG Task Force

Steering Committee Members

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Appendix 2. Search Strategy

1. Screening using Asia-Pacific BMI cut-offs

Database	Search Strategy / Search Terms	Date of Search	Results	
			Yield	Eligible
MEDLINE	((body mass index[MeSH Terms] AND cutoff) AND ((Pacific Islander) OR (Asian))) AND ((overweight[MeSH Terms]) OR (obesity[MeSH Terms]))	March 15, 2023	281	2
Cochrane CENTRAL	"body mass index" AND "overweight OR obese" "adult" AND "Asia-Pacific"	March 15, 2023	45	0
Guidelines / Organizations	**Search Strategy / Search Terms**	**Date of Search**	**Results**	
			Yield	**Yield**
NICE	"obesity" Filters: "Published", "Last 3 years", "NICE guidelines"	March 15, 2023	22	1
USPSTF	"obesity" Filters: "Published", "Metabolic, nutritional, and Endocrine Conditions", "Adult", "Screening"	March 15, 2023	9	0
WHO	"obesity"	March 15, 2023	4	0

2. Screening using waist circumference or waist-to-hip ratio

Database	Search Strategy / Search Terms	Date and Time of Search	Results	
			Yield	Eligible
PubMed	(("Waist Circumference"[Mesh] OR "Waist-Hip Ratio"[Mesh]) AND "Mass Screening"[Mesh])	January 3, 2023 12:37 PM	174	0
Cochrane Library	(waist circumference OR waist hip ratio) AND mass screening	January 3, 2023 3:46 PM	5	0
HERDIN	waist circumference OR waist hip ratio	February 14, 2023 11:30 AM	37	1

3. Screening for hypothyroidism

Database	Search Strategy / Search Terms	Date and Time of Search	Results	
			Yield	Eligible
MEDLINE	((((Obes*[Title/Abstract]) OR (Obesity[MeSH Terms])) OR ((overweight[MeSH Terms]) OR (overweight[Title/Abstract]))) AND ((("hypothyroidism"[MeSH Terms]) OR (Hypothyroid*[Title/Abstract])) OR (TSH[Title/Abstract]))) AND (((((((("guideline" [pt]) OR "practice guideline" [pt]) OR "Consensus"[mesh]) OR "Consensus Development Conference, NIH" [Publication Type]) OR "Consensus Development Conference" [Publication Type]) OR (consensuses[ti] OR consensus[ti] OR "position statement"[ti] OR "position statements"[ti] OR "practice parameter"[ti] OR "practice parameters"[ti] OR "appropriate use criteria" [ti] OR "appropriateness criteria" [ti] OR "guidance statement"[ti] OR "guidance statements"[ti] OR guideline[ti] or guidelines[ti] OR bulletin[ti])) OR ("MEDLINE"[Text Word] OR "systematic review"[Text Word] OR "meta-analysis"[Publication Type] OR "intervention*"[Title])) OR (("randomized controlled trial"[Publication Type] OR "controlled clinical trial"[Publication Type] OR "randomized"[Title/Abstract] OR "placebo"[Title/Abstract] OR "clinical trials as topic"[MeSH Terms] OR "randomly"[Title/Abstract] OR "trial"[Title]) NOT ("animals"[MeSH Terms] NOT "humans"[MeSH Terms]))))	January 23, 2023 7:57 PM	165	1
Cochrane Library	(MeSH descriptor: [Obesity] explode all trees OR (Obes*):ti,ab,kw OR MeSH descriptor: [Overweight] explode all trees OR Overweight AND MeSH descriptor: [Hypothyroidism] explode all trees OR Hypothyroid*	January 27, 2023 07:09 AM	166	0

Database	Search Strategy / Search Terms	Date and Time of Search	Results	
			Yield	Eligible
HERDIN	(Obesity OR Obese OR Overweight) AND (Hypothyroidism OR Hypothyroid)	January 28, 2023 2:30 PM	129	0
JAFES	Obesity	January 29, 2023 5:03 PM	136	0
Manual review of references	N/A	January 23-29, 2023	N/A	3

4. Screening for polycystic ovary syndrome

Database		Search Strategy / Search Terms	Date of Search	Results
PubMed	13	#9 OR #12	January 29, 2023	486
	12	#11 AND #8		383
	11	#3 AND #10		1,402
	10	(((((((("metformin"[Title/Abstract] OR "metformin"[MeSH Terms]) OR ("contraceptives, oral, combined"[MeSH Terms] OR "contraceptives, oral"[MeSH Terms])) OR ("levonorgestrel"[MeSH Terms] OR "levonorgestrel"[All Fields] OR ("ethinyl estradiol"[MeSH Terms] OR ("ethinyl"[All Fields] AND "estradiol"[All Fields]) OR "ethinyl estradiol"[All Fields] OR "ethinylestradiol"[All Fields] OR "ethinyloestradiol"[All Fields]) OR ("norethindrone"[MeSH Terms] OR "norethindrone"[All Fields] OR "norethisteron"[All Fields] OR "norethisterone"[All Fields]) OR ("cyproteron"[All Fields] OR "cyproterone"[MeSH Terms] OR "cyproterone"[All Fields]) OR (("desogestrel"[MeSH Terms] OR "desogestrel"[All Fields]) AND ("ethinyl estradiol"[MeSH Terms] OR ("ethinyl"[All Fields] AND "estradiol"[All Fields]) OR "ethinyl estradiol"[All Fields] OR "ethinylestradiol"[All Fields] OR "ethinyloestradiol"[All Fields])) OR ("levonorgestrel"[MeSH Terms] OR "levonorgestrel"[All Fields]) OR ("lynoestrenol"[All Fields] OR "lynestrenol"[MeSH Terms] OR "lynestrenol"[All Fields]) OR (("norgestrel"[MeSH Terms] OR "norgestrel"[All Fields]) AND ("ethinyl estradiol"[MeSH Terms] OR ("ethinyl"[All Fields] AND "estradiol"[All Fields]) OR "ethinyl estradiol"[All Fields] OR "ethinylestradiol"[All Fields] OR "ethinyloestradiol"[All Fields])) OR (("cyproteron"[All Fields] OR "cyproterone"[MeSH Terms] OR "cyproterone"[All Fields]) AND ("ethinyl estradiol"[MeSH Terms] OR ("ethinyl"[All Fields] AND "estradiol"[All Fields]) OR "ethinyl estradiol"[All Fields] OR "ethinylestradiol"[All Fields] OR "ethinyloestradiol"[All Fields])) OR ("desogestrel"[MeSH Terms] OR "desogestrel"[All Fields]) OR ("ethinylestradiol levonorgestrel"[All Fields] OR "ethinyloestradiol levonorgestrel"[All Fields]))) OR ("orlistat"[Title/Abstract])) OR ("Letrozole"[Title/Abstract] OR "Letrozole"[MeSH Terms] OR "Clomiphene"[MeSH Terms] OR "Clomiphene"[Title/Abstract] OR "clomifene"[Title/Abstract] OR "Gonadotropins"[MeSH Terms])) OR ("Pioglitazone"[Title/Abstract] OR "Pioglitazone"[MeSH Terms])) OR ("spironolactone"[Title/Abstract])) OR ("atorvastatin"[Title/Abstract] OR "simvastatin"[Title/Abstract] OR "rosuvastatin"[Title/Abstract] OR "Hydroxymethylglutaryl-CoA Reductase Inhibitors"[MeSH Terms])		268,363
	9	#7 AND #8		189
	8	("MEDLINE"[Text Word] OR "systematic review"[Text Word] OR "meta-analysis"[Publication Type] OR "intervention*"[Title]) OR (("randomized controlled trial"[Publication Type] OR "controlled clinical trial"[Publication Type] OR "randomized"[Title/Abstract] OR "placebo"[Title/Abstract] OR "clinical trials as topic"[MeSH Terms] OR "randomly"[Title/Abstract] OR "trial"[Title]) NOT ("animals"[MeSH Terms] NOT "humans"[MeSH Terms]))		1,902,122
	7	#3 AND #6		1,632
	6	#4 OR #5		865,775
	5	("Hyperandrogenism"[Mesh]) OR ((((((("Hirsutism"[Mesh]) OR (hirsutism[Title/Abstract])) OR ("Alopecia"[Mesh])) OR ((("Male pattern baldness"[Title/Abstract]) OR ("Androgenic alopecia"[Title/Abstract])) OR		53,820

Database		Search Strategy / Search Terms	Date of Search	Results
		("Androgenetic alopecia"[Title/Abstract])))) OR ("Menstruation Disturbances"[Mesh])) OR ("menstrual irregularity"[Title/Abstract]))		
	4	(("Mass Screening"[Mesh]) OR (screening[Title/Abstract])) OR (screen[Title/Abstract])		812,936
	3	#1 AND #2		5,743
	2	(("polycystic ovary"[Title/Abstract]) OR ("Polycystic Ovary Syndrome"[Mesh])) OR (pcos[Title/Abstract])		22,582
	1	(((((("Obesity"[Mesh]) OR "Overweight"[Mesh])) OR (obese[Title/Abstract])) OR (obesity[Title/Abstract])) OR (overweight[Title/Abstract])		441,389
CENTRAL	(polycystic ovaries OR PCOS):ti,ab,kw AND (screening OR screen):ti,ab,kw (Word variations have been searched)		January 29, 2023	157
JAFES	pcos or polycystic		January 29, 2023	19
Herdin Plus	pcos or polycystic		January 29, 2023	20

5. Screening for dysglycemia

Database	Search Strategy / Search Terms	Date and Time of Search	Results	
			Yield	Eligible
MEDLINE	(((((((“Overweight”[Mesh]) OR (“Obesity”[Mesh])) OR (obesity[Title/Abstract])) OR (overweight[Title/Abstract])) OR (obese[Title/Abstract])) AND (((prediabet*[tiab] OR pre diabet*[tiab] OR hyperglyc*[tiab] OR (“impaired fasting”[tiab] AND glucose[tiab]) OR IFG[tiab] OR “impaired FPG”[tiab] OR “glucose intolerance”[tiab] OR (“impaired glucose”[tiab] AND (tolerance[tiab] OR metabolism[tiab])) OR IGT[tiab] OR ((risk[tiab] OR progress*[tiab] OR prevent*[tiab] OR inciden*[tiab] OR conversion[tiab] OR develop*[tiab] OR delay*[tiab]) AND (diabetes[tiab] OR T2D*[tiab] OR NIDDM[tiab] OR “type 2”[tiab] OR “type II”[tiab])))))) AND ((((“Hypoglycemic Agents”[Mesh]) OR (((((((hypoglycemic agent*[Title/Abstract]) OR (hypoglycemic drug*[Title/Abstract])) OR (oral hypoglycemic agent*[Title/Abstract])) OR (oral hypoglycemic drug*[Title/Abstract])) OR (antdiabetic*[Title/Abstract])) OR (antidiabetic agent*[Title/Abstract])) OR (antidiabetic drug*[Title/Abstract])))) OR ((“Bariatric Surgery”[Mesh]) OR (((bariatric surgery[Title/Abstract]) OR (weight loss surgery[Title/Abstract])) OR (obesity surgery[Title/Abstract])))) OR ((((((intensive lifestyle intervention[Title/Abstract]) OR (lifestyle intervention[Title/Abstract])) OR (lifestyle modification[Title/Abstract])) OR (intensive lifestyle modification[Title/Abstract])) OR (behavioral therapy[Title/Abstract])) OR (behavioral intervention[Title/Abstract])))) AND (“MEDLINE”[Text Word] OR “systematic review”[Text Word] OR “meta-analysis”[Publication Type] OR “intervention*”[Title])	January 31, 2023 11:05:09 PM	857	1
Cochrane	#1 MeSH descriptor: [Obesity] #2 MeSH descriptor: [Overweight] #3 (obesity):ti,ab,kw OR (obese):ti,ab,kw OR (overweight):ti,ab,kw #4 #1 OR #2 OR #3 #5 (prediabet*):ti,ab,kw OR (pre diabet*):ti,ab,kw OR (hyperglyc*):ti,ab,kw OR ("impaired fasting glucose"):ti,ab,kw OR (IFG):ti,ab,kw #6 (impaired FPG):ti,ab,kw OR (glucose intolerance):ti,ab,kw OR (impaired glucose tolerance):ti,ab,kw OR (impaired glucose metabolism):ti,ab,kw OR (IGT):ti,ab,kw #7 (risk OR progress* OR prevent* OR inciden* OR conversion* OR develop* OR delay*):ti,ab,kw AND (diabetes* OR T2D* OR "type 2" OR "type II"):ti,ab,kw #8 #5 OR #6 OR #7 #9 #4 AND #8 #10 MeSH descriptor: [Hypoglycemic Agents]	February 1, 2023 12:59:06 AM	38	1

Database	Search Strategy / Search Terms	Date and Time of Search	Results	
			Yield	Eligible
	#11 (hypoglycemic agent):ti,ab,kw OR (hypoglycemic drug*):ti,ab,kw OR (oral hypoglycemic agent*):ti,ab,kw OR (oral hypoglycemic drug*):ti,ab,kw OR (antidiabetic):ti,ab,kw #12 (antidiabetic agent*):ti,ab,kw OR (antidiabetic drug*):ti,ab, #13 #10 OR #11 OR #12 #14 MeSH descriptor: [Bariatric Surgery] #15 (bariatric surgery):ti,ab,kw OR (weight loss surgery):ti,ab,kw OR (obesity surgery):ti,ab,kw #16 #14 OR #15 #17 (intensive lifestyle intervention):ti,ab,kw OR (lifestyle intervention):ti,ab,kw OR (lifestyle modification):ti,ab,kw OR (intensive lifestyle modification):ti,ab,kw OR (behavioral intervention):ti,ab,kw #18 #13 OR #16 OR #17 #19 #9 AND #18			

6. Screening for dyslipidemia

Database	Search Strategy / Search Terms	Date and Time of Search	Results	
			Yield	Eligible
Medline	(((((obese[MeSH Terms]) OR (obesity[MeSH Terms])) OR (obese[Title/Abstract])) OR (obesity[Title/Abstract])) AND ((dyslipidemia[MeSH Terms]) OR (dyslipidemia[Title/Abstract]))) AND ("MEDLINE"[Text Word] OR "systematic review"[Text Word] OR "meta-analysis"[Publication Type] OR "intervention*"[Title])	January 18, 2023 12:03 AM	441	15
Cochrane	Obesity AND Dyslipidemia	January 17, 2023 11:54 PM	48	0
HERDIN Plus	Abstract:obesity AND abstract:dyslipidemia	January 17, 2023 11:06 PM	42	0
HERDIN Plus	MESH:obesity AND MESH:dyslipidemia	January 17, 2023 11:10 PM	8	0

7. Screening for hypertension

Database	Search Strategy / Search Terms	Date and Time of Search	Results	
			Yield	Eligible
PubMed	“obesity”[MeSH] AND “hypertension”[MeSH] OR “high blood pressure”	12 February 2023 3:40 PM	217	0
Cochrane Library	“obesity” AND “hypertension” OR “high blood pressure” AND “screening”	12 February 2023 5:37 PM	133	0
Herdin	“obesity” AND “hypertension”	12 February 2023 5:37 PM	0	0

8. Screening for non-alcoholic fatty liver disease/non-alcoholic steatohepatitis

Database	Search Query		Search Details	Date and Time of Search	Results
PubMed	*Clinical practice guidelines*				
	7	((“Obesity”[Mesh] OR Obes*) AND (“Non-alcoholic Fatty Liver Disease”[Mesh] OR “NAFLD” OR “nonalcoholic steatohepatitis” OR “non-alcoholic steatohepatitis” OR “nonalcoholic fatty liver disease” OR “MAFLD” OR “Metabolic (dysfunction) associated liver disease” OR “Metabolic dysfunction	(“Obesity”[MeSH Terms] OR “obes*”[All Fields]) AND (“Non-alcoholic Fatty Liver Disease”[MeSH Terms] OR “NAFLD”[All Fields] OR “nonalcoholic steatohepatitis”[All Fields] OR “non-alcoholic steatohepatitis”[All Fields] OR “nonalcoholic fatty liver disease”[All Fields] OR	January 14, 2023 3:29:12	83

Database		Search Query	Search Details	Date and Time of Search	Results
		associated liver disease")) AND ((((((("guideline" [pt]) OR "practice guideline" [pt]) OR "Consensus"[mesh]) OR "Consensus Development Conference, NIH" [Publication Type]) OR "Consensus Development Conference" [Publication Type]) OR (consensuses[ti] OR consensus[ti] OR "position statement"[ti] OR "position statements"[ti] OR "practice parameter"[ti] OR "practice parameters"[ti] OR "appropriate use criteria" [ti] OR "appropriateness criteria" [ti] OR "guidance statement"[ti] OR "guidance statements"[ti] OR guideline[ti] or guidelines[ti] OR bulletin[ti]))	"MAFLD"[All Fields] OR "Metabolic dysfunction associated liver disease"[All Fields] OR "Metabolic dysfunction associated liver disease"[All Fields]) AND ("guideline"[Publication Type] OR "practice guideline"[Publication Type] OR "Consensus"[MeSH Terms] OR "consensus development conference, nih"[Publication Type] OR "Consensus Development Conference"[Publication Type] OR ("consensuses"[Title] OR "Consensus"[Title] OR "position statement"[Title] OR "position statements"[Title] OR "practice parameter"[Title] OR "practice parameters"[Title] OR "appropriate use criteria"[Title] OR "appropriateness criteria"[Title] OR "guidance statement"[Title] OR "guidance statements"[Title] OR "guideline"[Title] OR "guidelines"[Title] OR "bulletin"[Title]))		
	6	(((((("guideline" [pt]) OR "practice guideline" [pt]) OR "Consensus"[mesh]) OR "Consensus Development Conference, NIH" [Publication Type]) OR "Consensus Development Conference" [Publication Type]) OR (consensuses[ti] OR consensus[ti] OR "position statement"[ti] OR "position statements"[ti] OR "practice parameter"[ti] OR "practice parameters"[ti] OR "appropriate use criteria" [ti] OR "appropriateness criteria" [ti] OR "guidance statement"[ti] OR "guidance statements"[ti] OR guideline[ti] or guidelines[ti] OR bulletin[ti])	"guideline"[Publication Type] OR "practice guideline"[Publication Type] OR "Consensus"[MeSH Terms] OR "consensus development conference, nih"[Publication Type] OR "Consensus Development Conference"[Publication Type] OR "consensuses"[Title] OR "Consensus"[Title] OR "position statement"[Title] OR "position statements"[Title] OR "practice parameter"[Title] OR "practice parameters"[Title] OR "appropriate use criteria"[Title] OR "appropriateness criteria"[Title] OR "guidance statement"[Title] OR "guidance statements"[Title] OR "guideline"[Title] OR "guidelines"[Title] OR "bulletin"[Title]	January 14, 2023 2:28:53	156,321
	5	("Obesity"[Mesh] OR Obes*) AND ("Non-alcoholic Fatty Liver Disease"[Mesh] OR "NAFLD" OR "nonalcoholic steatohepatitis" OR "non-alcoholic steatohepatitis" OR "nonalcoholic fatty liver disease" OR "MAFLD" OR "Metabolic (dysfunction) associated liver disease" OR "Metabolic dysfunction associated liver disease")	("Obesity"[MeSH Terms] OR "obes*"[All Fields]) AND ("Non-alcoholic Fatty Liver Disease"[MeSH Terms] OR "NAFLD"[All Fields] OR "nonalcoholic steatohepatitis"[All Fields] OR "non-alcoholic steatohepatitis"[All Fields] OR "nonalcoholic fatty liver disease"[All Fields] OR "MAFLD"[All Fields] OR "Metabolic dysfunction associated liver disease"[All Fields] OR "Metabolic	January 14, 2023 2:27:58	12,382

Database		Search Query	Search Details	Date and Time of Search	Results
			dysfunction associated liver disease"[All Fields])		
	4	"Non-alcoholic Fatty Liver Disease"[Mesh] OR "NAFLD" OR "nonalcoholic steatohepatitis" OR "non-alcoholic steatohepatitis" OR "nonalcoholic fatty liver disease" OR "MAFLD" OR "Metabolic (dysfunction) associated liver disease" OR "Metabolic dysfunction associated liver disease"	"Non-alcoholic Fatty Liver Disease"[MeSH Terms] OR "NAFLD"[All Fields] OR "nonalcoholic steatohepatitis"[All Fields] OR "non-alcoholic steatohepatitis"[All Fields] OR "nonalcoholic fatty liver disease"[All Fields] OR "MAFLD"[All Fields] OR "Metabolic dysfunction associated liver disease"[All Fields] OR "Metabolic dysfunction associated liver disease"[All Fields]	January 14, 2023 2:27:29	36,576
	3	"Non-alcoholic Fatty Liver Disease"[Mesh]	"Non-alcoholic Fatty Liver Disease"[MeSH Terms]	January 14, 2023 2:27:11	21,479
	2	"Obesity"[Mesh] OR Obes*	"Obesity"[MeSH Terms] OR "obes*"[All Fields]	January 14, 2023 2:26:58	458,893
	1	"Obesity"[Mesh]		January 14, 2023 2:26:21	253,356
	Diagnostic studies				
	17	((((("Ultrasonography"[Mesh] OR "ultrasound") AND ("Sensitivity and Specificity"[Mesh] OR "diagnostic" OR "accuracy")) AND ("Biopsy"[Mesh] OR "liver biopsy")) AND (("Non-alcoholic Fatty Liver Disease"[Mesh] OR "NAFLD" OR "nonalcoholic steatohepatitis" OR "non-alcoholic steatohepatitis" OR "nonalcoholic fatty liver disease" OR "MAFLD" OR "Metabolic (dysfunction) associated liver disease" OR "Metabolic dysfunction associated liver disease") AND ("Obesity"[Mesh] OR Obes*))) AND (accuracy[Title/Abstract] OR sensitivity[Title/Abstract] OR specificity[Title/Abstract])	("Ultrasonography"[MeSH Terms] OR "ultrasound"[All Fields]) AND ("Sensitivity and Specificity"[MeSH Terms] OR "diagnostic"[All Fields] OR "accuracy"[All Fields]) AND ("Biopsy"[MeSH Terms] OR "liver biopsy"[All Fields]) AND (("Non-alcoholic Fatty Liver Disease"[MeSH Terms] OR "NAFLD"[All Fields] OR "nonalcoholic steatohepatitis"[All Fields] OR "non-alcoholic steatohepatitis"[All Fields] OR "nonalcoholic fatty liver disease"[All Fields] OR "MAFLD"[All Fields] OR "Metabolic dysfunction associated liver disease"[All Fields] OR "Metabolic dysfunction associated liver disease"[All Fields]) AND ("Obesity"[MeSH Terms] OR "obes*"[All Fields])) AND ("accuracy"[Title/Abstract] OR "sensitivity"[Title/Abstract] OR "specificity"[Title/Abstract])	January 27, 2023 1:22:55	84
	16	((("Ultrasonography"[Mesh] OR "ultrasound") AND ("Sensitivity and Specificity"[Mesh] OR "diagnostic" OR "accuracy")) AND ("Biopsy"[Mesh] OR "liver biopsy")) AND (("Non-alcoholic Fatty Liver Disease"[Mesh] OR "NAFLD" OR "nonalcoholic steatohepatitis" OR "non-alcoholic steatohepatitis" OR	("Ultrasonography"[MeSH Terms] OR "ultrasound"[All Fields]) AND ("Sensitivity and Specificity"[MeSH Terms] OR "diagnostic"[All Fields] OR "accuracy"[All Fields]) AND ("Biopsy"[MeSH Terms] OR "liver biopsy"[All Fields]) AND (("Non-alcoholic Fatty Liver Disease"[MeSH Terms] OR	January 27, 2023 0:22:19	207

Database		Search Query	Search Details	Date and Time of Search	Results
		"nonalcoholic fatty liver disease" OR "MAFLD" OR "Metabolic (dysfunction) associated liver disease" OR "Metabolic dysfunction associated liver disease") AND ("Obesity"[Mesh] OR Obes*))	"NAFLD"[All Fields] OR "nonalcoholic steatohepatitis"[All Fields] OR "non-alcoholic steatohepatitis"[All Fields] OR "nonalcoholic fatty liver disease"[All Fields] OR "MAFLD"[All Fields] OR "Metabolic dysfunction associated liver disease"[All Fields] OR "Metabolic dysfunction associated liver disease"[All Fields]) AND ("Obesity"[MeSH Terms] OR "obes*"[All Fields]))		
	15	"Sensitivity and Specificity"[Mesh] OR "diagnostic" OR "accuracy"	"Sensitivity and Specificity"[MeSH Terms] OR "diagnostic"[All Fields] OR "accuracy"[All Fields]	January 27, 2023 0:19:45	3,128,507
	11	"Ultrasonography"[Mesh] OR "ultrasound"	"Ultrasonography"[MeSH Terms] OR "ultrasound"[All Fields]	January 27, 2023 0:16:34	646,841
	9	"Biopsy"[Mesh] OR "liver biopsy"	"Biopsy"[MeSH Terms] OR "liver biopsy"[All Fields]	January 27, 2023 0:13:52	318,880
	5	("Non-alcoholic Fatty Liver Disease"[Mesh] OR "NAFLD" OR "nonalcoholic steatohepatitis" OR "non-alcoholic steatohepatitis" OR "nonalcoholic fatty liver disease" OR "MAFLD" OR "Metabolic (dysfunction) associated liver disease" OR "Metabolic dysfunction associated liver disease") AND ("Obesity"[Mesh] OR Obes*)	("Non-alcoholic Fatty Liver Disease"[MeSH Terms] OR "NAFLD"[All Fields] OR "nonalcoholic steatohepatitis"[All Fields] OR "non-alcoholic steatohepatitis"[All Fields] OR "nonalcoholic fatty liver disease"[All Fields] OR "MAFLD"[All Fields] OR "Metabolic dysfunction associated liver disease"[All Fields] OR "Metabolic dysfunction associated liver disease"[All Fields]) AND ("Obesity"[MeSH Terms] OR "obes*"[All Fields])	January 27, 2023 0:08:32	12,453
	4	"Non-alcoholic Fatty Liver Disease"[Mesh] OR "NAFLD" OR "nonalcoholic steatohepatitis" OR "non-alcoholic steatohepatitis" OR "nonalcoholic fatty liver disease" OR "MAFLD" OR "Metabolic (dysfunction) associated liver disease" OR "Metabolic dysfunction associated liver disease"	"Non-alcoholic Fatty Liver Disease"[MeSH Terms] OR "NAFLD"[All Fields] OR "nonalcoholic steatohepatitis"[All Fields] OR "non-alcoholic steatohepatitis"[All Fields] OR "nonalcoholic fatty liver disease"[All Fields] OR "MAFLD"[All Fields] OR "Metabolic dysfunction associated liver disease"[All Fields] OR "Metabolic dysfunction associated liver disease"[All Fields]	January 27, 2023 0:08:22	36,798
	3	"Non-alcoholic Fatty Liver Disease"[Mesh]	"Non-alcoholic Fatty Liver Disease"[MeSH Terms]	January 27, 2023 0:08:16	21,657
	2	"Obesity"[Mesh] OR Obes*	"Obesity"[MeSH Terms] OR "obes*"[All Fields]	January 27, 2023 0:08:08	459,992
	1	"Obesity"[Mesh]	"Obesity"[MeSH Terms]	January 27, 2023 0:08:04	253,844

Database		Search Query	Search Details	Date and Time of Search	Results
	Therapy				
	8	((("randomized controlled trial"[Publication Type] OR "controlled clinical trial"[Publication Type] OR "randomized"[Title/Abstract] OR "placebo"[Title/Abstract] OR "clinical trials as topic"[MeSH Terms] OR "randomly"[Title/Abstract] OR "trial"[Title]) NOT ("animals"[MeSH Terms] NOT "humans"[MeSH Terms])) AND (("Glucagon-Like Peptides"[Mesh] OR semaglutide OR liraglutide) AND ("Non-alcoholic Fatty Liver Disease"[Mesh] OR "NAFLD" OR "nonalcoholic steatohepatitis" OR "non-alcoholic steatohepatitis" OR "nonalcoholic fatty liver disease" OR "MAFLD" OR "Metabolic (dysfunction) associated liver disease" OR "Metabolic dysfunction associated liver disease"))) AND ("resolution")	(("randomized controlled trial"[Publication Type] OR "controlled clinical trial"[Publication Type] OR "randomized"[Title/Abstract] OR "placebo"[Title/Abstract] OR "clinical trials as topic"[MeSH Terms] OR "randomly"[Title/Abstract] OR "trial"[Title]) NOT ("animals"[MeSH Terms] NOT "humans"[MeSH Terms])) AND (("Glucagon-Like Peptides"[MeSH Terms] OR ("semaglutide"[Supplementary Concept] OR "semaglutide"[All Fields]) OR ("liraglutid"[All Fields] OR "liraglutide"[MeSH Terms] OR "liraglutide"[All Fields] OR "liraglutide s"[All Fields])) AND ("Non-alcoholic Fatty Liver Disease"[MeSH Terms] OR "NAFLD"[All Fields] OR "nonalcoholic steatohepatitis"[All Fields] OR "non-alcoholic steatohepatitis"[All Fields] OR "nonalcoholic fatty liver disease"[All Fields] OR "MAFLD"[All Fields] OR "Metabolic dysfunction associated liver disease"[All Fields] OR "Metabolic dysfunction associated liver disease"[All Fields])) AND "resolution"[All Fields]	3:36:20	12
	7	(("randomized controlled trial"[Publication Type] OR "controlled clinical trial"[Publication Type] OR "randomized"[Title/Abstract] OR "placebo"[Title/Abstract] OR "clinical trials as topic"[MeSH Terms] OR "randomly"[Title/Abstract] OR "trial"[Title]) NOT ("animals"[MeSH Terms] NOT "humans"[MeSH Terms])) AND (("Glucagon-Like Peptides"[Mesh] OR semaglutide OR liraglutide) AND ("Non-alcoholic Fatty Liver Disease"[Mesh] OR "NAFLD" OR "nonalcoholic steatohepatitis" OR "non-alcoholic steatohepatitis" OR "nonalcoholic fatty liver disease" OR "MAFLD" OR "Metabolic (dysfunction) associated liver disease" OR "Metabolic dysfunction associated liver disease"))	(("randomized controlled trial"[Publication Type] OR "controlled clinical trial"[Publication Type] OR "randomized"[Title/Abstract] OR "placebo"[Title/Abstract] OR "clinical trials as topic"[MeSH Terms] OR "randomly"[Title/Abstract] OR "trial"[Title]) NOT ("animals"[MeSH Terms] NOT "humans"[MeSH Terms])) AND (("Glucagon-Like Peptides"[MeSH Terms] OR ("semaglutide"[Supplementary Concept] OR "semaglutide"[All Fields]) OR ("liraglutid"[All Fields] OR "liraglutide"[MeSH Terms] OR "liraglutide"[All Fields] OR "liraglutide s"[All Fields])) AND ("Non-alcoholic Fatty Liver Disease"[MeSH Terms] OR "NAFLD"[All Fields] OR "nonalcoholic steatohepatitis"[All Fields] OR "non-alcoholic steatohepatitis"[All Fields] OR "nonalcoholic fatty liver disease"[All Fields] OR	3:33:58	81

Database		Search Query	Search Details	Date and Time of Search	Results
			"MAFLD"[All Fields] OR "Metabolic dysfunction associated liver disease"[All Fields] OR "Metabolic dysfunction associated liver disease"[All Fields]))		
	6	("randomized controlled trial"[Publication Type] OR "controlled clinical trial"[Publication Type] OR "randomized"[Title/Abstract] OR "placebo"[Title/Abstract] OR "clinical trials as topic"[MeSH Terms] OR "randomly"[Title/Abstract] OR "trial"[Title]) NOT ("animals"[MeSH Terms] NOT "humans"[MeSH Terms])	("randomized controlled trial"[Publication Type] OR "controlled clinical trial"[Publication Type] OR "randomized"[Title/Abstract] OR "placebo"[Title/Abstract] OR "clinical trials as topic"[MeSH Terms] OR "randomly"[Title/Abstract] OR "trial"[Title]) NOT ("animals"[MeSH Terms] NOT "humans"[MeSH Terms])	3:33:50	1,478,052
	5	("Glucagon-Like Peptides"[Mesh] OR semaglutide OR liraglutide) AND ("Non-alcoholic Fatty Liver Disease"[Mesh] OR "NAFLD" OR "nonalcoholic steatohepatitis" OR "non-alcoholic steatohepatitis" OR "nonalcoholic fatty liver disease" OR "MAFLD" OR "Metabolic (dysfunction) associated liver disease" OR "Metabolic dysfunction associated liver disease")	("Glucagon-Like Peptides"[MeSH Terms] OR ("semaglutide"[Supplementary Concept] OR "semaglutide"[All Fields]) OR ("liraglutid"[All Fields] OR "liraglutide"[MeSH Terms] OR "liraglutide"[All Fields] OR "liraglutide s"[All Fields])) AND ("Non-alcoholic Fatty Liver Disease"[MeSH Terms] OR "NAFLD"[All Fields] OR "nonalcoholic steatohepatitis"[All Fields] OR "non-alcoholic steatohepatitis"[All Fields] OR "nonalcoholic fatty liver disease"[All Fields] OR "MAFLD"[All Fields] OR "Metabolic dysfunction associated liver disease"[All Fields] OR "Metabolic dysfunction associated liver disease"[All Fields])	3:32:56	351
	4	"Glucagon-Like Peptides"[Mesh] OR semaglutide OR liraglutide	"Glucagon-Like Peptides"[MeSH Terms] OR "semaglutide"[Supplementary Concept] OR "semaglutide"[All Fields] OR "liraglutid"[All Fields] OR "liraglutide"[MeSH Terms] OR "liraglutide"[All Fields] OR "liraglutide s"[All Fields]	3:32:49	13,960
	3	"Glucagon-Like Peptides"[Mesh]	"Glucagon-Like Peptides"[MeSH Terms]	3:32:38	12,436
	2	"Non-alcoholic Fatty Liver Disease"[Mesh] OR "NAFLD" OR "nonalcoholic steatohepatitis" OR "non-alcoholic steatohepatitis" OR "nonalcoholic fatty liver disease" OR "MAFLD" OR "Metabolic (dysfunction) associated liver disease" OR "Metabolic dysfunction associated liver disease"	"Non-alcoholic Fatty Liver Disease"[MeSH Terms] OR "NAFLD"[All Fields] OR "nonalcoholic steatohepatitis"[All Fields] OR "non-alcoholic steatohepatitis"[All Fields] OR "nonalcoholic fatty liver disease"[All Fields] OR "MAFLD"[All Fields] OR "Metabolic dysfunction associated liver disease"[All Fields] OR "Metabolic dysfunction associated liver disease"[All Fields]	3:32:31	37,106

Database	Search Query		Search Details	Date and Time of Search	Results
	1	"Non-alcoholic Fatty Liver Disease"[Mesh]	"Non-alcoholic Fatty Liver Disease"[MeSH Terms]	3:32:24	21,869

9. Screening for obstructive sleep apnea

Database	Search Strategy / Search Terms	Date and Time of Search	Results	
			Yield	Eligible
Medline	(((screening) AND ((obesity) AND ((STOP-BANG)OR (obstructive sleep apnea)) NOT pregnant) AND ((screening) AND ((obesity) AND ((STOP-BANG) OR (obstructive sleep apnea)) NOT adolescents)) AND ((screening) AND ((obesity) AND ((STOP-BANG) OR ((obstructive sleep apnea)) NOT children)	January 3, 2023 10:07 PM	2085	132
COCHRANE	MeSH search PICO search obesity obstructive sleep apnea screening	January 3, 2023 11:30 PM	734	62
Google Scholar	obesity screening obstructive sleep apnea STOP-BANG	January 31, 2023 11:03 PM	5003	150
Clinicaltrials.gov	Obesity obstructive sleep apnea	March 4, 2023 3:30 PM	22	1

10. Screening for depression

Database		Search Query	Results
PubMed	6	Search: #4 AND #5; Filters: Free full text, Adult: 10+ years, from 2000-2023	21
	5	Search: PHQ9; Filters: Free full text, Adult: 10+ years, from 2000-2023	1,919
	4	Search: #1 AND #2 AND #3; Filters: Free full text, Adult: 10+ years, from 2000-2023	749
	3	Search: SCREENING; Filters: Free full text, Adult: 10+ years, from 2000-2023	635,015
	2	Search: DEPRESSION; Filters: Free full text, Adult: 10+ years, from 2000-2023	72,355
	1	Search: OBESITY; Filters: Free full text, Adult: 10+ years, from 2000-2023	64,829

11. Screening for osteoarthritis

Database	Search Strategy / Search Terms	Date and Time of Search	Results	
			Yield	Eligible
Medline	(((screening) AND ((obesity) AND (obstructive sleep apnea))	January 15, 2023 8:07PM	972	48
Cochrane	MeSH search PICO search obesity osteoarthritis screening	January 19, 2023 9:30 PM	0	0

12. Screening for use of obesogenic medications

Database	Search Strategy / Search Terms	Date and Time of Search	Results	
			Yield	Eligible
PubMed	("medication-induced"[All Fields] AND "weight gain"[All Fields]) OR "iatrogenic obesity"[All Fields] OR "obesogenic medication"[All Fields]	January 16, 2023 5:09PM	43	2
Cochrane	("medication-induced" "weight gain") OR "iatrogenic obesity" OR "obesogenic medication"	January 16, 2023 5:09PM	14	0

Appendix 3. Summary of COI Declarations

Name	Affiliation	Summary of Declared COIs	Management
Steering Committee			
Maricel B. Malazarte, MD	Vicente Sotto Memorial Medical Center (VSMMC)	Financial COI	To declare COI
Nemencio A. Nicodemus Jr., MD	University of the Philippines Manila (UPM) College of Medicine	Financial COI	To declare COI
Karen F. Caudor, MD	VSMMC	None	-
Marjorie A. Ramos, MD	Far Eastern University – Dr. Nicanor Reyes Medical Foundation Medical Center Quezon City; St. Luke's Medical Center Quezon City	Financial COI	-
Maria Christina Kristin S. Reyes, MD	Ateneo de Manila University School of Medicine and Public Health	Financial COI	-
Jardine S. Sta. Ana, MD	Philippine General Hospital (PGH)	None	-
Celeste C. Tanchoco, MPH, DrPH	International Life Science Institute South East Asia Region Philippine Committee, Inc.	Non-financial COI	-
Zenaida F. Velasco, MA	University of Santo Tomas (UST)	None	-
Oversight Committee			
Maria Philina B. Pablo-Villamor, MD	VSMMC	None	-
Gina Antonina S. Eubanas, MD	St. Frances Cabrini Medical Center	None	-
Nathaniel S. Orillaza Jr., MD	UPM College of Medicine	None	-
Technical Coordinator			
Cary Amiel G. Villanueva, MD, MPH	PGH	None	-
Evidence Review Experts			
Ma. Cecille Añonuevo-Cruz, MD, Msc	UPM College of Medicine	Financial COI	To declare COI
Anna Elvira S. Arcellana, MD	Capitol Medical Center	None	-
Orielle Kyra B. Castro, MD	Ospital ng Imus	None	-
Marie Gene D. Cruz, MD	Metropolitan Medical Center College of Medicine	None	-
Elaine C. Cunanan, MD, MHPEd	UST Hospital	Financial COI	To declare COI
Lea Roselle O. De Castro-Medina, MD	PGH	None	-
Jose Eduardo De Leon Duya, MD	The Medical City Clark	None	-
Mark David D. Francisco, MD	St. Paul Hospital Bulacan Inc.	None	-
Franz Michael M. Magnaye	Mary Mediatrix Medical Center	None	-
Rhoda Zyra M. Padilla-Baraoidan, RPh, MD	Las Piñas General Hospital and Satellite Trauma Center	None	-
Andrew Rufino Villafuerte, MD	Asian Hospital and Medical Center	None	-
Emilio Q. Villanueva III, MD, MSc	UPM College of Medicine	Financial, non-financial COI	To declare COI
Consensus Panelists			
Jonathan Joy D. Adora, MD	Philippine Society of Metabolic and Bariatric Surgery	Non-financial COI	To declare COI

Name	Affiliation	Summary of Declared COIs	Management
Hercules Callanta	Philippine Association for the Study of Overweight and Obesity Inc.	Non-financial COI	To declare COI
Ian Homer Cua, MD	Philippine Society of Gastroenterology	Non-financial COI	To declare COI
Kristopher P. De Leon, MD	Philippine Academy of Rehabilitation Medicine	None	-
Araceli S. Lanorio	Philippine Alliance of Patient Organizations	None	-
Aveline Sue Ann L. Lim, MD	Philippine College of Endocrinology, Diabetes, and Metabolism, Inc	Financial, non-financial COI	To declare COI
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Diana Alcantara-Payawal, MD, DTMH	Philippine College of Physicians	Non-financial COI	To declare COI
Olive D. Quizon, MD, MPH	Philippine Academy of Family Physicians	Non-financial COI	To declare COI
Gerard Danielle K. Sio, MD, MOH	Philippine College of Occupational Medicine	Non-financial COI	To declare COI
Marianna Ramona S. Sioson, MD, MSc	Philippine College of Medical Nutrition Physicians	Financial COI	Cannot vote for some questions
Maria Theresa Rosquetta, MD	Philippine Heart Association	Non-financial COI	To declare COI
Allen Gideon R. Tan, MD	Philippine Obstetrical and Gynecological Society	None	-
Ma. Eloisa E. Villaraza, RND, MSCN	Nutritionist Dietitians Association of the Philippines	Non-financial COI	To declare COI
Rosemarie P. Holandes	Department of Health	DOH representative	Non-voting
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Carolyn Narvacan-Montano, MD	Makati Medical Center; Mary Mediatrix Medical Center	Financial COI	Non-voting
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Appendix 4. Implementation Tools

Summary of Classification Criteria

Index test	Condition	Criteria / Cut-offs
BMI (WHO-APP) [5]	Overweight /Obesity	Overweight: ≥23.0 kg/m^2 At-risk: 23–24.9 kg/m^2 Obese I: 25–29.9 kg/m^2 Obese II: ≥30 kg/m^2
WC (WHO-APP) [5]	Obesity	Obese: ≥90 cm (male), ≥80 cm (female)
WHR (WHO) [5]	Obesity	Obese: ≥1.0 (male), ≥0.85 (female)
Rotterdam consensus [56,57]	PCOS	At least two of three symptoms: • Oligo-anovulation ○ Bleeding interval <21 days ○ Bleeding interval >35 days, <8 episodes of menses/year ○ Infertility ○ No menstruation for 3 consecutive months in the last 12 months • Hyperandrogenism ○ Clinical: ▪ Hirsutism (modified Ferriman-Gallwey score ≥8) ▪ Acne ▪ Male-pattern alopecia ○ Biochemical ▪ Elevated total testosterone or free testosterone ▪ Elevated androstenedione ▪ Elevated dehydroepiandrosterone ▪ Elevated dehydroepiandrosterone sulfate • Polycystic ovaries ○ ≥12 follicles, 2-9 mm in diameter ○ Ovarian volume >10 mL in one ovary
ACR clinical classification criteria [201]	Knee OA	• Using history and physical examination. Knee pain + any 3 of the following: ○ >50 years of age ○ <30 minutes of morning stiffness ○ Crepitus on active motion ○ Bony tenderness ○ Bony enlargement ○ No palpable warmth of synovium • Using history, physical examination, and radiographic findings. Knee pain + any 1 of the following: ○ >50 years of age ○ <30 minutes of morning stiffness ○ Crepitus on active motion and osteophytes • Using history, physical examination, and laboratory findings. Knee pain + any 5 of the following: ○ >50 years of age ○ <30 minutes of morning stiffness ○ Crepitus on active motion ○ Bony tenderness ○ Bony enlargement ○ No palpable warmth of synovium ○ ESR < 40mm/hour ○ RF < 1:40 ○ SF signs of osteoarthritis

Measurement of WC and WHR

1. Subject stands with feet 25–30 cm apart, weight evenly distributed.
2. Measurer sits by the side of the subject and fits the tape snugly but not compressing soft tissues.
    a. *Waist circumference*: measurement is taken midway between the inferior margin of the last rib and the crest of the ilium in a horizontal plane.
    b. *Hip circumference*: measurement is taken around the pelvis at the point of maximal protrusion of the buttocks.
3. Circumference is measured to nearest 0.1 cm.
4. Wait-to-hip ratio: Divide the waist circumference by the hip circumference.

Procedure from World Health Organization Western Pacific Region. The Asia-Pacific perspective: Redefining obesity and its treatment. 2000.
https://apps.who.int/iris/bitstream/handle/10665/206936/0957708211_eng.pdf?sequence=1&isAllowed=y

Measurement of Blood Pressure

- The patient should be relaxed and rested >5min, in a sitting position, feet flat on the floor, back supported.
- No coffee, smoking, or exercise in the last 30 minutes.
- Urinary bladder should be emptied.
- No talking for both the patient and observer.
- The patient's arm should be resting on a desk.
- Check BP on both arms and use the arm with the higher BP on subsequent BP determination.
- The cuff should be of correct size, placed snug over the upper arm that is preferably without sleeves, with its middle portion at the level of the heart. It should cover 40% of the upper arm and 80% of the arm circumference (standard bladder for adults is 13 cm wide, 22-24 cm long).
- When using a manual device, cuff deflation should be done at 2 mmHg/sec.
- Ideally, the systolic pressure should be estimated initially by the pulse obliteration upon inflation. Actual auscultatory determination is then done by inflating the cuff 20-30 mmHg above this palpated estimate.
- For auscultatory determination, use the fifth Korotkoff sound to determine the diastolic BP.
- Use an average ≥ 2 readings obtained on ≥ 2 occasions as an estimate of the BP level.
- The interval between BP measurements should be 1-2 min apart.

Procedure from Philippine Society of Hypertension and Philippine Heart Association. 2020 Clinical Practice Guidelines for the Management of Hypertension in the Philippines. 2000.
https://drive.google.com/file/d/1t3UFLQG6XxTUNkVniliIbKnvnUVmDuKD/view?usp=sharing

STOPBANG

Screening Tool for Obstructive Sleep Apnea

Please answer the following questions below:

		Yes	No
Snoring:	Do you snore loudly (louder than talking or loud enough to be heard through closed doors)?		
Tiredness or fatigue:	Do you often feel tired, fatigued or sleepy during the daytime – even after a good night's sleep?		
Observed apnea:	Has anyone ever observed you stop breathing during your sleep?		
Pressure:	Are you being treated for high blood pressure?		
Body mass index over 35:	Height (meters): _____ Weight (kg): _____ BMI: _____		
Age:	Are you older than 50 years?		
Neck size:	Does your neck measure more than 40 cm around? If yes, what is the measurement? _____ cm		
Gender:	Are you male?		

Score ☐

If you have answered Yes to 3 or more of these questions, there is a likelihood of Obstructive Sleep Apnea.

STOP-BANG questionnaire downloaded from https://www.qvh.nhs.uk/download/stop-bang-questionnaire/

PATIENT HEALTH QUESTIONNAIRE-9 (PHQ-9)

Over the last 2 weeks, how often have you been bothered by any of the following problems? *(Use "✔" to indicate your answer)*	**Not at all**	**Several days**	**More than half the days**	**Nearly every day**
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed, or hopeless	0	1	2	3
3. Trouble falling or staying asleep, or sleeping too much	0	1	2	3
4. Feeling tired or having little energy	0	1	2	3
5. Poor appetite or overeating	0	1	2	3
6. Feeling bad about yourself — or that you are a failure or have let yourself or your family down	0	1	2	3
7. Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed? Or the opposite — being so fidgety or restless that you have been moving around a lot more than usual	0	1	2	3
9. Thoughts that you would be better off dead or of hurting yourself in some way	0	1	2	3

FOR OFFICE CODING 0 + _____ + _____ + _____

=Total Score: _____

If you checked off any problems, how difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?

Not difficult at all	**Somewhat difficult**	**Very difficult**	**Extremely difficult**
☐	☐	☐	☐

Patient Health Questionnaire-9 (PHQ-9) downloaded from https://www.apa.org/depression-guideline/patient-health-questionnaire.pdf. The Filipino version of the tool may be accessed from https://www.phqscreeners.com/select-screener.

Appendix 5. AGREE Reporting Checklist (Self Evaluation)

This checklist is intended to guide the reporting of clinical practice guidelines.

CHECKLIST ITEM AND DESCRIPTION	REPORTING CRITERIA	Page #
DOMAIN 1: SCOPE AND PURPOSE		
1. OBJECTIVES *Report the overall objective(s) of the guideline. The expected health benefits from the guideline are to be specific to the clinical problem or health topic.*	☒ Health intent(s) (i.e., prevention, screening, diagnosis, treatment, etc.) ☒ Expected benefit(s) or outcome(s) ☒ Target(s) (e.g., patient population, society)	13-14
2. QUESTIONS *Report the health question(s) covered by the guideline, particularly for the key recommendations.*	☒ Target population ☒ Intervention(s) or exposure(s) ☒ Comparisons (if appropriate) ☒ Outcome(s) ☐ Health care setting or context	15-17
3. POPULATION *Describe the population (i.e., patients, public, etc.) to whom the guideline is meant to apply.*	☒ Target population, sex and age ☒ Clinical condition (if relevant) ☐ Severity/stage of disease (if relevant) ☐ Comorbidities (if relevant) ☒ Excluded populations (if relevant)	14-17
DOMAIN 2: STAKEHOLDER INVOLVEMENT		
4. GROUP MEMBERSHIP *Report all individuals who were involved in the development process. This may include members of the steering group, the research team involved in selecting and reviewing/rating the evidence and individuals involved in formulating the final recommendations.*	☒ Name of participant ☐ Discipline/content expertise (e.g., neurosurgeon, methodologist) ☒ Institution (e.g., St. Peter's hospital) ☐ Geographical location (e.g., Seattle, WA) ☒ A description of the member's role in the guideline development group	90, 101-102
5. TARGET POPULATION PREFERENCES AND VIEWS *Report how the views and preferences of the target population were sought/considered and what the resulting outcomes were.*	☒ Statement of type of strategy used to capture patients'/publics' views and preferences (e.g., participation in the guideline development group, literature review of values and preferences) ☒ Methods by which preferences and views were sought (e.g., evidence from literature, surveys, focus groups) ☐ Outcomes/information gathered on patient/public information ☒ How the information gathered was used to inform the guideline development process and/or formation of the recommendations	20

CHECKLIST ITEM AND DESCRIPTION	REPORTING CRITERIA	Page #
6. TARGET USERS *Report the target (or intended) users of the guideline.*	☒ The intended guideline audience (e.g., specialists, family physicians, patients, clinical or institutional leaders/administrators) ☐ How the guideline may be used by its target audience (e.g., to inform clinical decisions, to inform policy, to inform standards of care)	14
DOMAIN 3: RIGOUR OF DEVELOPMENT		
7. SEARCH METHODS *Report details of the strategy used to search for evidence.*	☒ Named electronic database(s) or evidence source(s) where the search was performed (e.g., MEDLINE, EMBASE, PsychINFO, CINAHL) ☒ Time periods searched (e.g., January 1, 2004 to March 31, 2008) ☒ Search terms used (e.g., text words, indexing terms, subheadings) ☒ Full search strategy included (e.g., possibly located in appendix)	18, 91-100
8. EVIDENCE SELECTION CRITERIA *Report the criteria used to select (i.e., include and exclude) the evidence. Provide rationale, where appropriate.*	☐ Target population (patient, public, etc.) characteristics ☒ Study design ☐ Comparisons (if relevant) ☒ Outcomes ☐ Language (if relevant) ☐ Context (if relevant)	18-19
9. STRENGTHS & LIMITATIONS OF THE EVIDENCE *Describe the strengths and limitations of the evidence. Consider from the perspective of the individual studies and the body of evidence aggregated across all the studies. Tools exist that can facilitate the reporting of this concept.*	☒ Study design(s) included in body of evidence ☒ Study methodology limitations (sampling, blinding, allocation concealment, analytical methods) ☐ Appropriateness/relevance of primary and secondary outcomes considered ☒ Consistency of results across studies ☒ Direction of results across studies ☒ Magnitude of benefit versus magnitude of harm ☒ Applicability to practice context	18-19, 23-72

CHECKLIST ITEM AND DESCRIPTION	REPORTING CRITERIA	Page #
10. FORMULATION OF RECOMMENDATIONS *Describe the methods used to formulate the recommendations and how final decisions were reached. Specify any areas of disagreement and the methods used to resolve them.*	☒ Recommendation development process (e.g., steps used in modified Delphi technique, voting procedures that were considered) ☒ Outcomes of the recommendation development process (e.g., extent to which consensus was reached using modified Delphi technique, outcome of voting procedures) ☒ How the process influenced the recommendations (e.g., results of Delphi technique influence final recommendation, alignment with recommendations and the final vote)	19-21
11. CONSIDERATION OF BENEFITS AND HARMS *Report the health benefits, side effects, and risks that were considered when formulating the recommendations.*	☒ Supporting data and report of benefits ☒ Supporting data and report of harms/side effects/risks ☒ Reporting of the balance/trade-off between benefits and harms/side effects/risks ☒ Recommendations reflect considerations of both benefits and harms/side effects/risks	23-72
12. LINK BETWEEN RECOMMENDATIONS AND EVIDENCE *Describe the explicit link between the recommendations and the evidence on which they are based.*	☒ How the guideline development group linked and used the evidence to inform recommendations ☒ Link between each recommendation and key evidence (text description and/or reference list) ☒ Link between recommendations and evidence summaries and/or evidence tables in the results section of the guideline	19-21, 23-72

CHECKLIST ITEM AND DESCRIPTION	REPORTING CRITERIA	Page #
13. EXTERNAL REVIEW *Report the methodology used to conduct the external review.*	☒ Purpose and intent of the external review (e.g., to improve quality, gather feedback on draft recommendations, assess applicability and feasibility, disseminate evidence) ☒ Methods taken to undertake the external review (e.g., rating scale, open-ended questions) ☒ Description of the external reviewers (e.g., number, type of reviewers, affiliations) ☐ Outcomes/information gathered from the external review (e.g., summary of key findings) ☒ How the information gathered was used to inform the guideline development process and/or formation of the recommendations (e.g., guideline panel considered results of review in forming final recommendations)	22
14. UPDATING PROCEDURE *Describe the procedure for updating the guideline.*	☒ A statement that the guideline will be updated ☒ Explicit time interval or explicit criteria to guide decisions about when an update will occur ☐ Methodology for the updating procedure	75
DOMAIN 4: CLARITY OF PRESENTATION		
15. SPECIFIC AND UNAMBIGUOUS RECOMMENDATIONS *Describe which options are appropriate in which situations and in which population groups, as informed by the body of evidence.*	☒ A statement of the recommended action ☒ Intent or purpose of the recommended action (e.g., to improve quality of life, to decrease side effects) ☒ Relevant population (e.g., patients, public) ☒ Caveats or qualifying statements, if relevant (e.g., patients or conditions for whom the recommendations would not apply) ☒ If there is uncertainty about the best care option(s), the uncertainty should be stated in the guideline	12, 23-72
16. MANAGEMENT OPTIONS *Describe the different options for managing the condition or health issue.*	☒ Description of management options ☒ Population or clinical situation most appropriate to each option	23-72

CHECKLIST ITEM AND DESCRIPTION	REPORTING CRITERIA	Page #
17. IDENTIFIABLE KEY RECOMMENDATIONS *Present the key recommendations so that they are easy to identify.*	☒ Recommendations in a summarized box, typed in bold, underlined, or presented as flow charts or algorithms ☒ Specific recommendations grouped together in one section	12
DOMAIN 5: APPLICABILITY		
18. FACILITATORS AND BARRIERS TO APPLICATION *Describe the facilitators and barriers to the guideline's application.*	☒ Types of facilitators and barriers that were considered ☐ Methods by which information regarding the facilitators and barriers to implementing recommendations were sought (e.g., feedback from key stakeholders, pilot testing of guidelines before widespread implementation) ☐ Information/description of the types of facilitators and barriers that emerged from the inquiry (e.g., practitioners have the skills to deliver the recommended care, sufficient equipment is not available to ensure all eligible members of the population receive mammography) ☐ How the information influenced the guideline development process and/or formation of the recommendations	23-73
19. IMPLEMENTATION ADVICE/TOOLS *Provide advice and/or tools on how the recommendations can be applied in practice.*	☒ Additional materials to support the implementation of the guideline in practice. For example: o Guideline summary documents o Links to check lists, algorithms o Links to how-to manuals o Solutions linked to barrier analysis (see Item 18) o Tools to capitalize on guideline facilitators (see Item 18) o Outcome of pilot test and lessons learned	103-106

CHECKLIST ITEM AND DESCRIPTION	REPORTING CRITERIA	Page #
20. RESOURCE IMPLICATIONS *Describe any potential resource implications of applying the recommendations.*	☒ Types of cost information that were considered (e.g., economic evaluations, drug acquisition costs) ☒ Methods by which the cost information was sought (e.g., a health economist was part of the guideline development panel, use of health technology assessments for specific drugs, etc.) ☒ Information/description of the cost information that emerged from the inquiry (e.g., specific drug acquisition costs per treatment course) ☒ How the information gathered was used to inform the guideline development process and/or formation of the recommendations	20, 73
21. MONITORING/AUDITING CRITERIA *Provide monitoring and/or auditing criteria to measure the application of guideline recommendations.*	☒ Criteria to assess guideline implementation or adherence to recommendations ☐ Criteria for assessing impact of implementing the recommendations ☐ Advice on the frequency and interval of measurement ☐ Operational definitions of how the criteria should be measured	74
DOMAIN 6: EDITORIAL INDEPENDENCE		
22. FUNDING BODY *Report the funding body's influence on the content of the guideline.*	☒ The name of the funding body or source of funding (or explicit statement of no funding) ☒ A statement that the funding body did not influence the content of the guideline	3, 22
23. COMPETING INTERESTS *Provide an explicit statement that all group members have declared whether they have any competing interests.*	☒ Types of competing interests considered ☒ Methods by which potential competing interests were sought ☒ A description of the competing interests ☐ How the competing interests influenced the guideline process and development of recommendations	22, 101-102