AMREF INTERNATIONAL UNIVERSITY

SCHOOL OF MEDICAL SCIENCES

DEPARTMENT OF REHABILIATION MEDICINE

BACHELOR OF SCIENCE IN PHYSIOTHERAPY

END OF TRIMESTER EXAMINATIONS DECEMBER TO APRIL 2026

UNIT CODE: PHT 324

UNIT NAME: Evidence based practice (upgrading exam)

DATE: 15th APRIL 2026

TIME: 6pm-8pm

INSTRUCTIONS

1. **All students will have two (2) hours to complete the examination**
2. **This is an online exam, Attempt all questions as per the instruction**
3. **It is the student's responsibility to report any page and number missing in this paper.**
4. **Check that the paper is complete**
5. **Total number of pages is 13 including the cover.**
6. **Read through the paper quickly before you start.**

Multiple choice questions. Answer all

1. How does the "PICO" framework assist in evidence-based practice?
   A. By analysing statistical results.
   B. By enhancing clinical expertise.
   C. By structuring well-defined clinical questions.
   D. By summarizing research findings

2. What level of evidence corresponds to findings from a single high-quality randomized controlled trial (RCT)?
   a. Level I
   b. Level II
   c. Level III
   d. Level IV
3. Which of the following best describes "bias" in research?
   a. An impartial approach to data analysis.
   b. The presence of random variations in results.
   c. A systematic error that distorts research findings.
   d. The use of qualitative research methodologies

4. What is a key feature of a well-designed randomized controlled trial (RCT)?
   a. Participants are assigned to groups based on their preference.
   b. Researchers know which participants are receiving the intervention, but participants do not.
   c. Participants are randomly assigned to either the treatment or control group.
   d. The study lacks a comparison group.
5. Which of the following is a key characteristic of qualitative research?
   a. Emphasis on statistical significance.
   b. Use of numerical data.
   c. Focus on exploring subjective experiences.
   d. Relying solely on expert opinions

6. Which of the following is a key component of the "Methods" section in a research article?
   a. Interpreting the results.
   b. Describing the study's theoretical framework.
   c. Presenting the study's limitations.
   d. Detailing the study's design and data collection methods.
7. Which study design is most appropriate for exploring the prevalence of a specific condition in a population?
   a. Randomized controlled trial.
   b. Cross-sectional study.
   c. Case-control study.
   d. Cohort study.
8. In the hierarchy of evidence, which level represents evidence obtained from expert opinions?
   a. Level I.

b. Level II.
c. Level III.
d. Level V.

9. What is the primary purpose of the "Abstract" section in a research article?
   a. To provide a summary of the study's findings.
   b. To list all the references used in the study.
   c. To present the study's methodology.
   d. To discuss the limitations of the study

10. What is the purpose of randomization in a randomized controlled trial?
    a. To ensure that all participants receive the same treatment.
    b. To eliminate the need for a control group.
    c. To control for confounding variables and distribute them evenly across groups.
    d. To increase the sample size of the study.
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12. What is the primary goal of a case report study design?
    a. To establish causality between variables.
    b. To explore the prevalence of a specific condition in a population.
    c. To describe unique patient cases for clinical learning.
    d. To compare treatment outcomes in different groups.
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Please use this figure for questions 14, 15, 16, and 17.

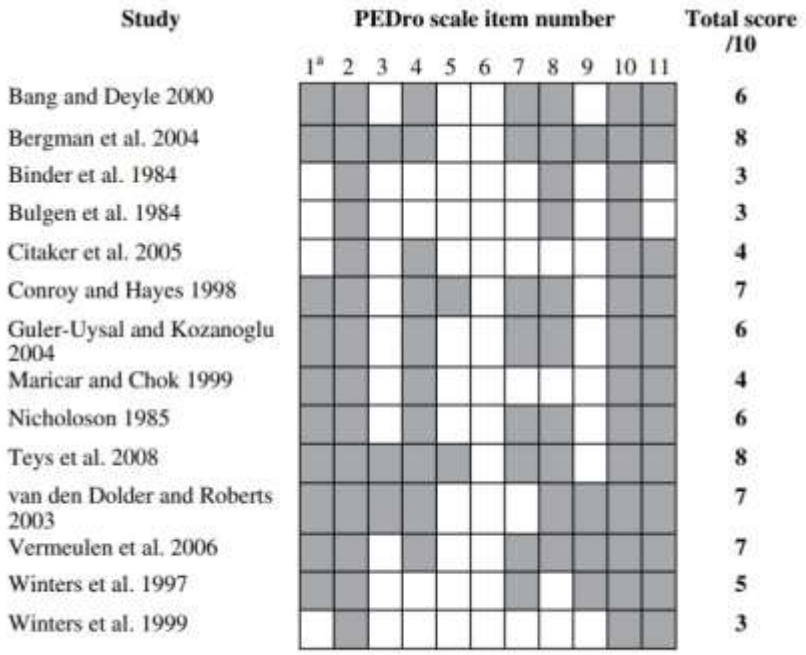


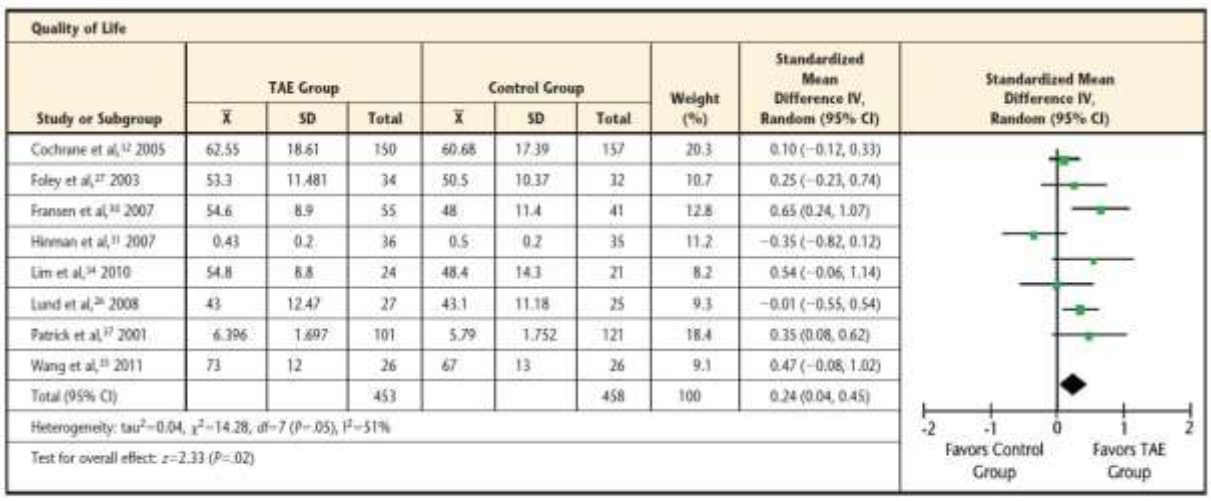
Fig. 2. Pedro score table. [a]Criteria 1 was not used to calculate the PEDro score. □ = criteria not met. ■ = criteria met. Pedro Scale item. 1. Eligibility criteria were specified. 2. Subjects were randomly allocated to groups. 3. Allocation was concealed. 4. The groups were similar at baseline regarding the most important prognostic indicators. 5. There was blinding of all subjects. 6. There was blinding of all therapists who administered the therapy. 7. There was blinding of all assessors who measured at least one key outcome. 8. Measures of at least one key outcome were obtained from more than 85% of the subjects initially allocated to groups. 9. All subjects for whom outcome measures were available received the treatment or control condition as allocated or, where this was not the case, data for at least one key outcome was analyzed by "intention to treat". 10. The results of between-group statistical comparisons are reported for at least one key outcome. 11. The study provides both point measures and measures of variability for at least one key outcome.

14. Among the 14 studies included in the systematic review, which of the following had the poorest design quality?
    a. Teys et al. (2008)
    b. Conroy and Hayes (1998)
    c. Bergmann et al (2004)
    d. Winters et al (1999)
15. Among the 14 studies included in the systematic review, how many failed to blind study assessors?
    a. 6
    b. 8
    c. 14
    d. 0
16. Among the 14 studies included in the systematic review, how many reported central tendency (e.g., mean) and dispersion, or variability (e.g., standard deviation) for at least one dependent variable?
    a. 11

b. 12
c. 6
d. 2

17. Among the 14 studies included in the systematic review, how many informed the inclusion/exclusion criteria?
    a. 2
    b. 14
    c. 6
    d. 10

Please use this figure for questions 18, 19 and 20



Quality of Life

Study or Subgroup	TAE Group $\bar{X}$	TAE Group SD	TAE Group Total	Control Group $\bar{X}$	Control Group SD	Control Group Total	Weight (%)	Standardized Mean Difference IV, Random (95% CI)
Cochrane et al,[32] 2005	62.55	18.61	150	60.68	17.39	157	20.3	0.10 (−0.12, 0.33)
Foley et al,[27] 2003	53.3	11.481	34	50.5	10.37	32	10.7	0.25 (−0.23, 0.74)
Fransen et al,[33] 2007	54.6	8.9	55	48	11.4	41	12.8	0.65 (0.24, 1.07)
Hinman et al,[31] 2007	0.43	0.2	36	0.5	0.2	35	11.2	−0.35 (−0.82, 0.12)
Lim et al,[34] 2010	54.8	8.8	24	48.4	14.3	21	8.2	0.54 (−0.06, 1.14)
Lund et al,[26] 2008	43	12.47	27	43.1	11.18	25	9.3	−0.01 (−0.55, 0.54)
Patrick et al,[17] 2001	6.396	1.697	101	5.79	1.752	121	18.4	0.35 (0.08, 0.62)
Wang et al,[35] 2011	73	12	26	67	13	26	9.1	0.47 (−0.08, 1.02)
Total (95% CI)			453			458	100	0.24 (0.04, 0.45)
Heterogeneity: tau^2=0.04, χ^2=14.28, df=7 (P=.05), I^2=51%								
Test for overall effect: z=2.33 (P=.02)								

Standardized Mean Difference IV, Random (95% CI)

-2 -1 0 1 2

Favors Control Group | Favors TAE Group

Figure 4.
Forest plots showing the effect of therapeutic aquatic exercise (TAE) on quality of life. 95% CI=95% confidence interval.

18. Among the studies depicted in Figure 4, which had the largest sample size?
    a. Wang et al, 2011
    b. Cochrane et al, 2005
    c. Lim et al, 2010
    d. Patrick et al, 2001
19. How many studies found statistically significant results that favored therapeutic aquatic exercise (TAE) on quality of life in patients with lower limb osteoarthritis?
    a. One
    b. Six
    c. Seven
    d. Two
20. Among the studies depicted in Figure 4, which had the largest sample size?
    a. Wang et al, 2011
    b. Cochrane et al, 2005
    c. Lim et al, 2010
    d. Patrick et al, 2001
21. What is the main advantage of a systematic review over an individual study?
    a. It provides expert opinions on a topic.

b. It eliminates the need for statistical analysis.
c. It synthesizes findings from multiple studies to provide stronger evidence.
d. It focuses on a single patient's experience.

22. What is the purpose of a forest plot in a systematic review?
    a. To illustrate the distribution of participant demographics.
    b. To display the study's funding sources.
    c. To visualize the effect sizes of individual studies and the overall effect.
    d. To present qualitative data.
23. Which type of evidence is considered the least reliable in the hierarchy of evidence?
    a. Expert opinion.
    b. Systematic reviews.
    c. Randomized controlled trials.
    d. Cohort studies.
24. What does the term "effect size" indicate in research?
    a. The statistical significance of the findings.
    b. The probability of type II error.
    c. The magnitude of the observed effect.
    d. The validity of the research design.
25. Which type of bias occurs when participants' knowledge of their treatment affects their behavior or reporting?
    a. Selection bias.
    b. Observer bias.
    c. Recall bias.
    d. Performance bias.
26. Which statement accurately describes a cross-over study design?
    a. Participants are randomly assigned to different treatment groups.
    b. The study is conducted in multiple centers.
    c. Participants receive all treatments in a random sequence.
    d. The study examines long-term treatment outcomes.
27. Which factor is critical for ensuring the generalizability of research findings?
    a. Using a convenience sample.
    b. Conducting a single-case study.
    c. Enrolling only healthy participants.
    d. Including diverse and representative participants
28. During the ASK phase of the EBP process, a clinician is refining a clinical query regarding a new post-operative recovery protocol. Which of the following actions best represents the primary goal of this specific stage to ensure the subsequent steps are effective?
    a. Identifying the most appropriate medical database to search for high-quality randomized controlled trials.
    b. Translating a clinical uncertainty into a structured, searchable format that defines specific patient parameters and outcomes.
    c. Critically evaluating the feasibility of implementing a new intervention within the constraints of the current clinical setting.

d. Narrowing the scope of a clinical problem to ensure that the retrieved evidence is directly applicable to the individual patient's preferences.

29. When examining the methodological hierarchy of evidence-based practice, what is the primary technical distinction between a systematic review and a meta-analysis?
    a. A systematic review evaluates the quality of literature, while a meta-analysis is used only when there is high heterogeneity among the included study results.
    b. A systematic review is a comprehensive qualitative summary of evidence, whereas a meta-analysis is the specific statistical procedure used to integrate numerical data from those studies.
    c. A systematic review focuses on the bias assessment of individual trials, while a meta-analysis focuses on the clinical significance of the combined effect size.
    d. A systematic review requires a pre-defined search protocol, whereas a meta-analysis is an independent study design used when primary data is unavailable.
30. A senior clinician is deciding on a treatment plan for a patient with a chronic condition. The clinician identifies a high-quality meta-analysis supporting "Treatment A," but the patient expresses strong concerns about its side effects and prefers "Treatment B," which has less robust but still positive evidence. Additionally, the clinic lacks the specialized equipment required for "Treatment A." According to the evolved definition of Evidence-Based Practice, which of the following best describes the "judicious" application of EBP in this scenario?
    a. Prioritizing the meta-analysis as the "best available external clinical evidence" to ensure the patient receives the most scientifically validated care.
    b. Integrating the research evidence with the clinician's expertise to persuade the patient that the benefits of "Treatment A" outweigh their personal values.
    c. Synthesizing the research evidence and clinical expertise while treating the patient's values and the clinic's resource constraints as the final determining factors.
    d. Selecting "Treatment B" primarily because EBP dictates that the characteristics of the practice environment and patient circumstances supersede systematic research.
31. In the clinical question—"Is prophylactic physical therapy for patients undergoing upper abdominal surgery effective in preventing post-operative pulmonary complications?"—which of the following best defines the Intervention (I) component of the PICO framework?
    a. Pre-operative screening for respiratory risk factors.
    b. Implementation of a prophylactic physical therapy regimen.
    c. Standard post-operative nursing care and early ambulation.
    d. Prevention of post-operative pulmonary complications.
32. A therapist wants to ensure the research question is "answerable" and specifically addresses the mechanical nature of the intervention. Which formulation best minimizes ambiguity for a systematic search?
    a. Among adults with chronic low back pain, how does the McKenzie method of MDT compare to usual physiotherapy care in achieving significant pain reduction and functional improvement within a 3-month timeframe?

b. In adults with chronic low back pain, what is the comparative effectiveness of the McKenzie method of MDT versus usual physiotherapy care for reducing pain and improving function at 3 months?
c. For adults with chronic low back pain, is the McKenzie method of MDT more effective than usual physiotherapy care (manual therapy and exercise) for pain reduction and functional improvement at 3 months?
d. Does the application of the McKenzie method (MDT) in adults with chronic low back pain result in superior pain and functional outcomes at 3 months when measured against standard manual therapy and exercise?

33. A clinical trial for a new antihypertensive drug reports a p-value of 0.001, leading to its inclusion in several international clinical guidelines. Despite this, a policy review board is hesitant to mandate the drug's use across all primary care clinics, citing concerns over the "quality mark" of the evidence and its practical application. Which statement most accurately reflects the challenge of "marginal benefits" and "misappropriated evidence" as described in the text?

a. The evidence-based "quality mark" is frequently ignored by clinicians because the volume of clinical guidelines has become unmanageable.
b. Statistically significant results may fail to translate into meaningful improvements for patients, especially if the evidence was influenced by vested interests.
c. Clinical guidelines are often management-driven, meaning that even marginal benefits are enforced despite a lack of patient-centeredness.
d. The misappropriation of evidence occurs primarily because clinical guidelines have reached a volume that is no longer statistically significant.

34. A clinical educator is investigating whether the method of skin preparation (using povidone-iodine versus chlorhexidine gluconate) influences the rate of surgical site infections in patients undergoing abdominal surgery. The educator tracks 50 patients over a six-month period to observe infection outcomes. In the scenario described above, which of the following is the dependent variable?

a. The 50 patients undergoing abdominal surgery.
b. The type of antiseptic used for skin preparation.
c. The six-month observation period.
d. The rate of surgical site infections.

35. A nursing research team is conducting a study to determine if scheduled repositioning every 2 hours reduces the incidence of pressure ulcers in bedbound elderly patients compared to standard care. The study follows 40 patients over a 30-day period in a long-term care facility to monitor skin integrity. In the research scenario described above, which of the following represents the independent variable?

a. The development of pressure ulcers during the 30-day period.
b. The 40 elderly patients residing in the long-term care facility.
c. The frequency of repositioning (scheduled every 2 hours).
d. The standard of care baseline for skin integrity.

36. A student physical therapist is treating a 16-year-old athlete with a Grade II ankle sprain. The Clinical Instructor suggests using High-Voltage Pulsed Current (HVPC)

electrical stimulation specifically to decrease localized edema (swelling). The student performs a literature search to see if HVPC actually leads to a greater reduction in limb girth compared to standard ice and elevation alone. In the research scenario described above, which of the following represents the iindependent variable?

a. The degree of limb girth reduction measured in centimeters.
b. The 16-year-old female soccer player with a Grade II sprain.
c. The application of High-Voltage Pulsed Current (HVPC).
d. The clinical setting where the physical therapy occurs.

37. A clinician is preparing to search the medical literature to address a mother's concern regarding a potential link between the MMR vaccine and the development of autism in her 13-month-old daughter. Which of the following represents the most accurately formulated PICO-based research question for this clinical scenario?

a. In healthy 13-month-old children, does the administration of the MMR vaccine increase the risk of developing autism compared to children who remain unvaccinated?
b. Is the MMR vaccine safer than the individual measles, mumps, and rubella vaccines for preventing serious childhood developmental delays and autism?
c. In toddlers with a family history of developmental problems, what is the incidence of autism following the standard childhood immunization schedule?
d. Does the MMR vaccine effectively prevent measles in healthy infants given that measles is often considered a minor childhood illness by parents?

38. You are a Physiotherapist in a post-surgical unit caring for a 65-year-old male who has just undergone a total knee arthroplasty. To manage his post-operative pain, the surgeon has prescribed standard opioid medication. However, the patient's wife asks if continuous cryotherapy (cold compression therapy) would be more effective than intermittent ice packs in reducing the patient's narcotic consumption during the first 48 hours of recovery. Which of the following represents the most accurate and searchable PICO-formatted research question for this clinical case?

a. In patients undergoing total knee arthroplasty, does continuous cryotherapy reduce the need for opioid medication compared to the use of intermittent ice packs during the early post-operative period?
b. Does the application of cold compression therapy improve the range of motion and functional outcomes in elderly male patients following major orthopedic surgery?
c. In post-surgical patients, is continuous cryotherapy more cost-effective for the hospital than standard intermittent icing protocols for pain management?
d. Is there a significant difference in the recovery time for a 65-year-old male patient when using advanced cryotherapy technology versus traditional nursing interventions?

39. When integrating peer-reviewed conference papers and book chapters into an evidence-based physiotherapy treatment plan, which factor is most critical for the clinician to consider regarding the "quality" of these sources?

a. The inherent high quality of the work is guaranteed by the publisher's commitment to the peer-review process across all formats including books and articles.
b. Conference papers and books are generally exempt from the scrutiny of peer review, making journal articles the only reliable source for clinical decision-making.
c. The rigorous nature of peer review varies across different types of literature, and the clinician must remain vigilant for systemic failures that allow lower-quality work to be disseminated.
d. Peer review serves as a filter that eliminates the need for individual clinician appraisal once a work has been accepted for publication by a reputable house.

40. A physiotherapy student is conducting a systematic search for evidence regarding the management of patellofemoral pain syndrome. To ensure the search results are highly specific and specifically constrained to only those articles containing every individual concept in the search string, which of the following best describes the function of the AND operator?

a. It instructs the database to include any of the specified search terms, thereby narrowing the search by requiring the presence of all terms simultaneously.
b. It serves to focus the search by requiring that all identified terms appear in the results, though the specific order of the terms is typically not a requirement.
c. It broadens the search parameters by ensuring that at least one of the search terms is present in the database results, making the search more focused.
d. It acts as a default setting in all medical databases to ensure that multiple words entered are treated as a single exact phrase to narrow the results.

41. When developing a search strategy for a clinical question regarding stroke rehabilitation, a student decides to use the OR operator between the terms "hemiparesis" and "hemiplegia." Which of the following best explains the technical impact of this decision on the search results?

a. It narrows the search to articles where both "hemiparesis" and "hemiplegia" are present, facilitating the retrieval of synonyms.
b. It broadens the search by allowing for the retrieval of records where any or all of the specified terms are present, effectively running multiple similar searches at once.
c. It identifies related concepts by requiring the database to find results where the terms are present in a specific, predefined proximity to one another.
d. It increases search sensitivity by instructing the database that all search terms must appear, ensuring a comprehensive collection of synonyms.

42. In EBP, what does "blinding" refer to in a research study?

a. Hiding research findings.
b. Concealing the study's purpose.
c. Keeping the participants unaware of their group assignment.
d. Avoiding data collection.

43. In a high-quality RCT investigating the efficacy of a new manual therapy technique compared to sham soft-tissue mobilization, which of the following scenarios best describes the implementation of "triple-blinding" to minimize detection and analysis bias?
    a. The patient, the treating physical therapist, and the independent assessor recording the range of motion outcomes remain unaware of the group allocation throughout the study duration.
    b. The study participants, the primary investigator responsible for patient recruitment, and the statistician performing the data analysis are kept unaware of which group received the active intervention.
    c. The participants, the outcome assessors measuring the clinical variables, and the data analysts interpreting the results are blinded to the treatment assignments until the conclusion of the study.
    d. The participants, the treating clinicians, and the ethics committee members are provided with coded data to ensure that no individual involved in the intervention can identify the treatment group.

44. A physiotherapy researcher is concerned that the lack of blinding of the treating therapist in an exercise-based RCT will lead to "performance bias." Which of the following strategies is the most robust method to mitigate the effects of this specific bias when blinding the therapist is physically impossible?
    a. Utilizing an independent, blinded assessor to collect all primary and secondary outcome measures to ensure objective data capture.
    b. Implementing a standardized treatment protocol and strictly monitoring therapist-patient interaction to ensure equal attention and encouragement across both groups.
    c. Ensuring strict allocation concealment using an opaque, sequential numbering system managed by an off-site coordinator.
    d. Increasing the sample size to power the study sufficiently to account for the potential variability introduced by the unblinded therapists.

45. What is the purpose of a forest plot in a systematic review?

    a. To illustrate the distribution of participant demographics.
    b. To display the study's funding sources.
    c. To visualize the effect sizes of individual studies and the overall effect.
    d. To present qualitative data.

46. In a randomized controlled trial comparing a new blood flow restriction (BFR) protocol to traditional heavy-load resistance training for post-ACL reconstruction patients, a confounding variable is best described as:
    a. A secondary outcome measure, such as the Lysholm Knee Scale, used to support the primary findings of the Quadriceps Index.
    b. A factor, such as the patient's pre-injury activity level, that is associated with both the intervention group assignment and the recovery rate, potentially distorting the perceived effect of the BFR.
    c. The specific intensity of the exercise (e.g., 30% vs. 80% 1RM) that the researcher deliberately manipulates to observe changes in muscle hypertrophy.
    d. A continuous numerical variable, such as degrees of knee flexion, that fluctuates naturally throughout the course of the rehabilitation program.

47. Which of the following is True about the Appraisal step of Evidence Based Practice?

    a. The appraisal step only considers research with perfect methodologies.
    b. Appraisal is an integral step in Evidence Based Practice
    c. During appraisal, only the most recent research is considered valuable.
    d. The appraisal step is done in isolation of the other steps of Evidence based Practice

48. In a study to determine the effect of manual therapy combined with exercise on pain, disability, and quality of life in individuals with nonspecific neck pain; reported that With a low certainty of evidence, 16 studies demonstrated that manual therapy plus exercise is significantly better than exercise alone for reducing pain (-0.95 (95%CI: -1.38, -0.51)). Similarly, with low certainty of evidence, 13 studies demonstrated that manual therapy plus exercise is significantly better than exercise alone for reducing disability (-0.59 (95% CI: -0.90, -0.28)). Four studies demonstrated that manual therapy plus exercise is significantly better than a control intervention for reducing pain (moderate certainty) (-2.15 (95%CI: -3.58, -0.73)) and disability (low certainty) (-2.39 (95% CI: -3.80, -0.98)). With a high certainty of evidence, four studies demonstrated no significant difference between manual therapy plus exercise and exercise alone in quality of life (SMD of -0.02 (95% CI: -0.21, 0.18)).

    Above is an extract from an article's abstract. Determine the study design of the above abstract
    a. Systemic review
    b. Meta-analysis
    c. Both systemic review and meta-analysis
    d. Randomized clinical trial

49. The following question is formulated using the PICO framework. Which type of question has been formulated below; "Do women adults with low back pain have more associated risk factors as compared to their male counterparts?"

    a. Prognosis
    b. Etiology
    c. Prevention
    d. Prognosis

50. When appraising the relevance of a study to your research question, which of the following aspects is LEAST important to consider?
    a. The methodology used in the study
    b. The publication date of the article
    c. The funding source for the research
    d. The specific population studied in the research