**CHAPTER THREE**

**METHODOLOGY**

**3.1 Study design**

This study was design base on systematic reviews of studies evaluating prognostic and diagnostic biomarkers for bladder cancer that were published in 2022. The research was limited to only 2022 Year due to time factor.

**3.2 Literature search strategy**

A systematic review of the literature was conducted according to the Cochrane Methods Group for systematic review of diagnostic and prognostic biomarkers for bladder cancer.

PubMed, Science direct, Google scholar, and Medicine were searched from 2021 up to January 2023, for relevant publication. Two reviewers independently (Umar Muhammad and Aliyu Adamu Ahmad) checked the Title and Abstract of the selected articles for relevant records. Duplicate publications were removed. If a group published twice on the same population, the latest publication was included. The terms and combination were used in the databases are (("prognostic"[All Fields] OR "prognostical"[All Fields] OR "prognostically"[All Fields] OR "prognosticate"[All Fields] OR "prognosticated"[All Fields] OR "prognosticates"[All Fields] OR "prognosticating"[All Fields] OR "prognostication"[All Fields] OR "prognostications"[All Fields] OR "prognosticator"[All Fields] OR "prognosticators"[All Fields] OR "prognostics"[All Fields] OR ("prognosis/diagnosis"[MeSH Terms] OR "prognosis/genetics"[MeSH Terms])) AND ("diagnosis"[MeSH Terms] OR "diagnosis"[All Fields] OR "diagnostic"[All Fields] OR "diagnostical"[All Fields] OR "diagnostically"[All Fields] OR "diagnostics"[All Fields] OR ("diagnosis/anatomy and histology"[MeSH Terms] OR "diagnosis/diagnosis"[MeSH Terms] OR "diagnosis/physiopathology"[MeSH Terms])) AND ("biomarker s"[All Fields] OR "biomarkers"[MeSH Terms] OR "biomarkers"[All Fields] OR "biomarker"[All Fields] OR ("biomarkers, tumor/anatomy and histology"[MeSH Terms] OR "biomarkers, tumor/urine"[MeSH Terms])) AND ("urinary bladder neoplasms"[MeSH Terms] OR ("urinary"[All Fields] AND "bladder"[All Fields] AND "neoplasms"[All Fields]) OR "urinary bladder neoplasms"[All Fields] OR ("bladder"[All Fields] AND "cancer"[All Fields]) OR "bladder cancer"[All Fields] OR ("urinary bladder neoplasms/diagnosis"[MeSH Terms] OR "urinary bladder neoplasms/pathology"[MeSH Terms] OR "urinary bladder neoplasms/prevention and control"[MeSH Terms]))) AND (2022:2022[pdat]). The obtain search result were then reviewed and using covidence tool to screened in order to determine their relevance.

**3.3 STUDY SELECTION**

The online tool covidence (<https://www.covidence.org>) was used to manage the selected records from the bibliographic databases. Publications were independently screened on title and abstract by two reviewers (Umar Muhammad BASUG/UG/BHS/ANA/18/133 and Aliyu Adamu Ahmad BASUG/UG/BHS/ANA/18/). If title and abstract were inconclusive, full-text was screened. Original articles on prognostic or diagnostic biomarker for bladder cancer were eligible for inclusion. Studies had to be writing in English. Animal studies and studies without primary data (e.g. commentaries, reviews) were excluded. Studies that did not discussed prognostic or diagnostic biomarkers for bladder cancer were excluded as well. Also studies that were carried out above the stated date were excluded. Articles that are not free access were also excluded. Disagreements between the reviewers were discussed in a meeting between them.

**3.4 Data extraction**

The first reviewer, Umar Muhammad, BUSUG/UG/BHS/ANA/18/133, independently extracted the data, while the second reviewer, Aliyu Adamu Ahmad, BUSUG/UG/BHS/ANA/18, cross-checked the derived data. Data from the selected studies were retrieved and entered into Microsoft Word together with the pertinent information about the publication's features. (For example, the initial author's name and the year, biomarkers, the sample from which the biomarkers were gathered (for example, proteins or genes), the source (for instance, urine, blood, or tissue), the routes for the biomarkers, and the reason for the biomarker's identification.

**3.5 Quality assessment**

The two reviewers independently evaluated the included studies' quality using the Assessment of Diagnostic Accuracy Studies (QUADAS)-2 tools, which was designed for observational studies like cohort and case-control studies. The Assessment of Diagnostic Accuracy Studies (QUADAS)-2 tools consist of about four domains, which are the patient selection, index test, reference standard, and flow and timing.