

INTRODUCTION

- Primary stability is defined as the biomechanical stability upon implant insertion and is **influenced by a number of factors** including: the implant design, the surgical technique, and the bone quantity and quality.
- Resonance Frequency Analysis**, which can be used to **provide an implant stability quotient (ISQ)** and **Insertion torque (IT)** are commonly used non-invasive diagnostic surrogate methods for assessing primary stability.
- Lack of primary stability** has been associated with **adverse healing**, forming **fibrous encapsulation** rather than osseointegration.
- Primary stability of dental implants is considered **critical for successful osseointegration** and survival when utilising **immediate implant loading**.
- However, there is **paucity of evidence** to conclude whether primary stability is equally critical in **implants placed with non-immediate loading protocols**.

RESEARCH QUESTION

In patients requiring an implant supported restoration with **non-immediate loading protocol**, are there differences in **survival of implants placed with and without primary stability?**

MATERIALS & METHODS

- This systematic review was conducted in accordance with the PRISMA guidelines (Moher et al, 2009). The review was **registered** with the **PROSPERO database (CRD42020204143)**
- Studies included reported: **ISQ or IT values**, with **at least 10 patients**, a minimum follow up of **1 year** of implants placed with **non-immediate loading protocol**, written in English.
- This study reports the analysis of the **17 studies** that provided ISQ or IT values for individual implants.
- For the analysis, implants were dichotomised into having a **ISQ of <60 or ≥60** and/or an **IT of <35 or ≥35**.
- Fisher’s Exact test** was used to determine evidence of any difference between the **proportions of survival and failures** between the two groups.
- The **distribution** of the values for the ISQ<60 and IT< 35 were assessed using the **Mann-Whitney U Test for survival and non-survival**.
- Random effects meta-analysis** was carried out for the odds of survival, an **odds of 1 indicated no difference** in the survival of the two groups.

FIGURE 1: ISQ RANDOM EFFECTS META-ANALYSIS

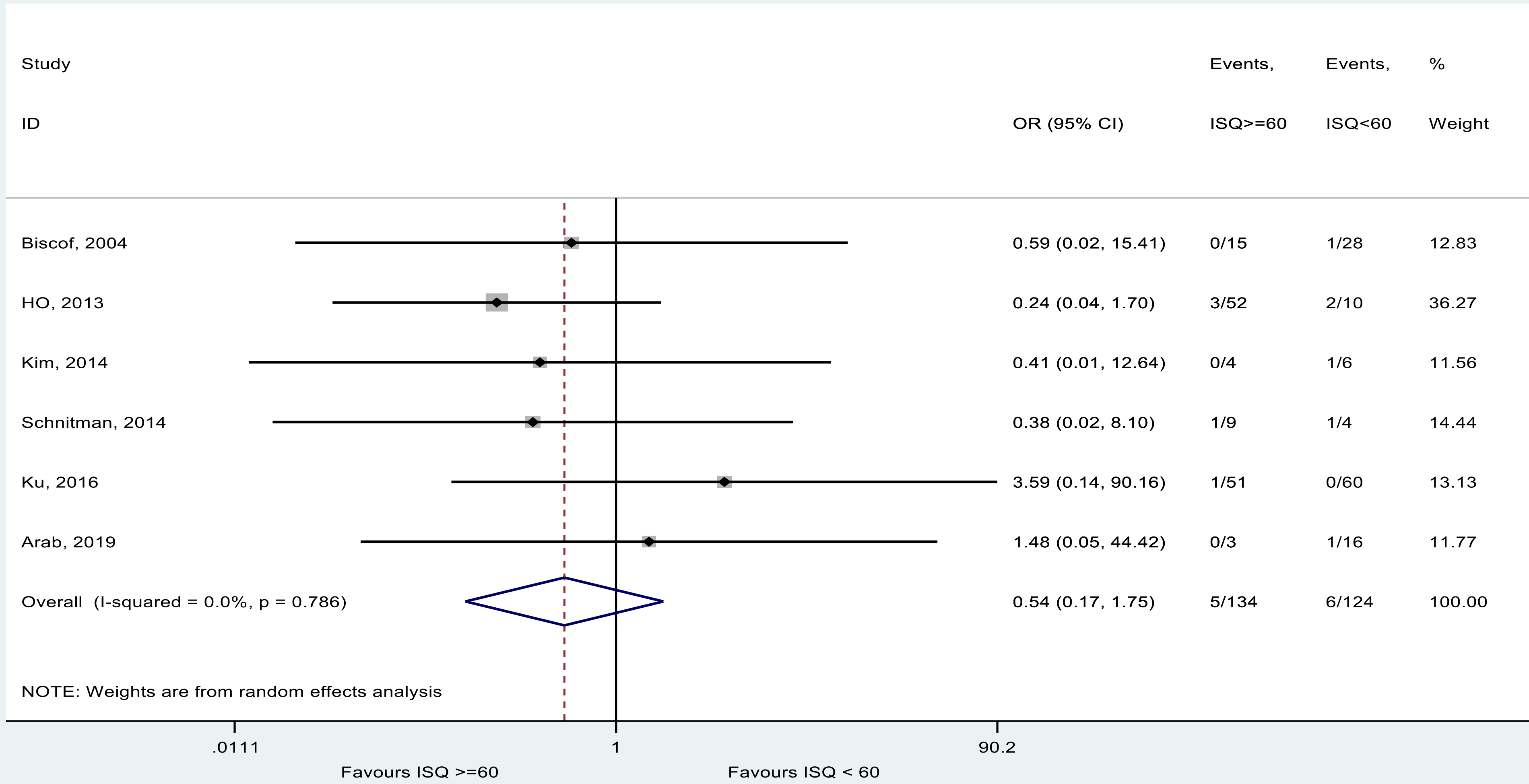


FIGURE 2: IT RANDOM EFFECTS META-ANALYSIS

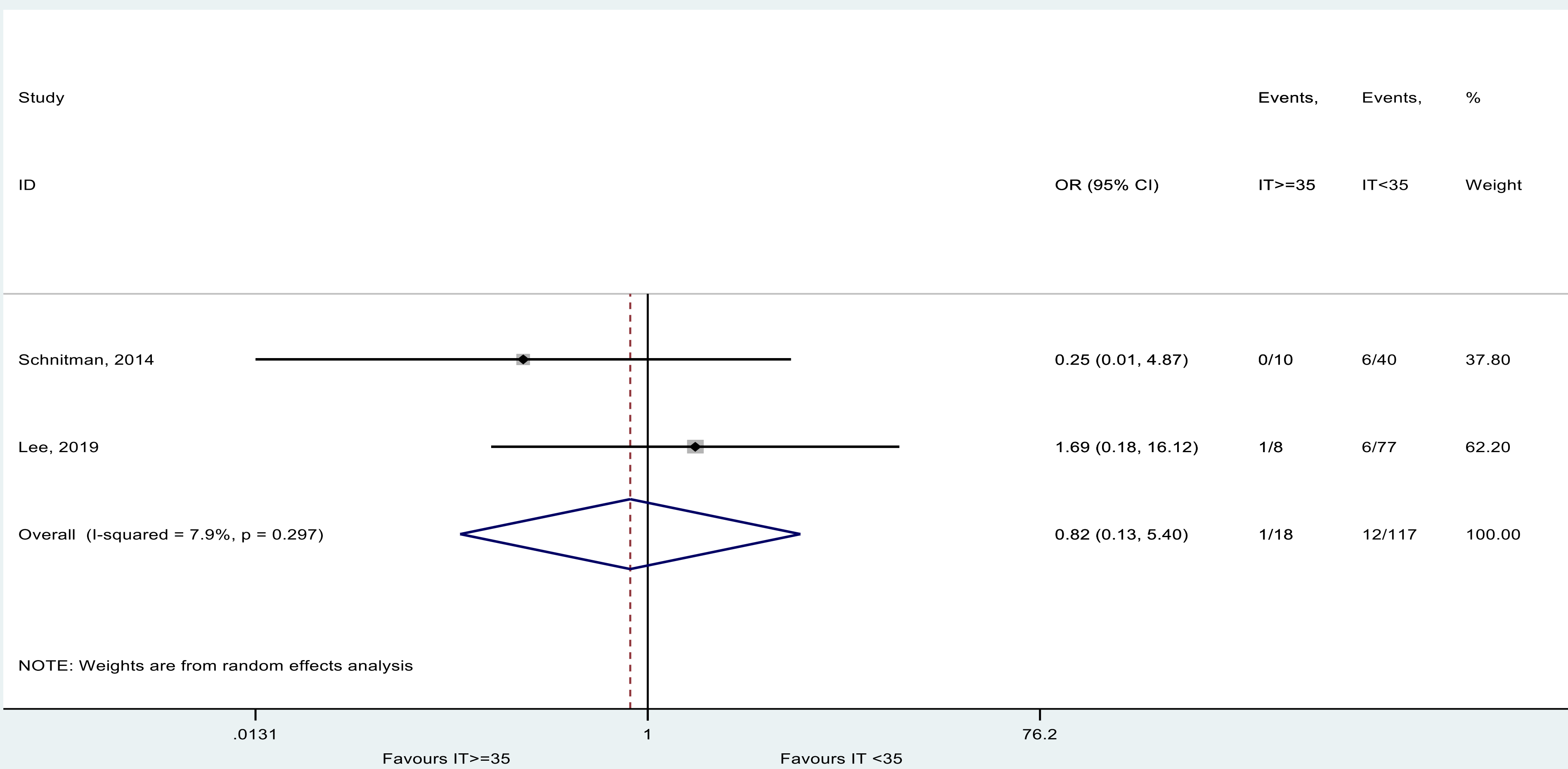
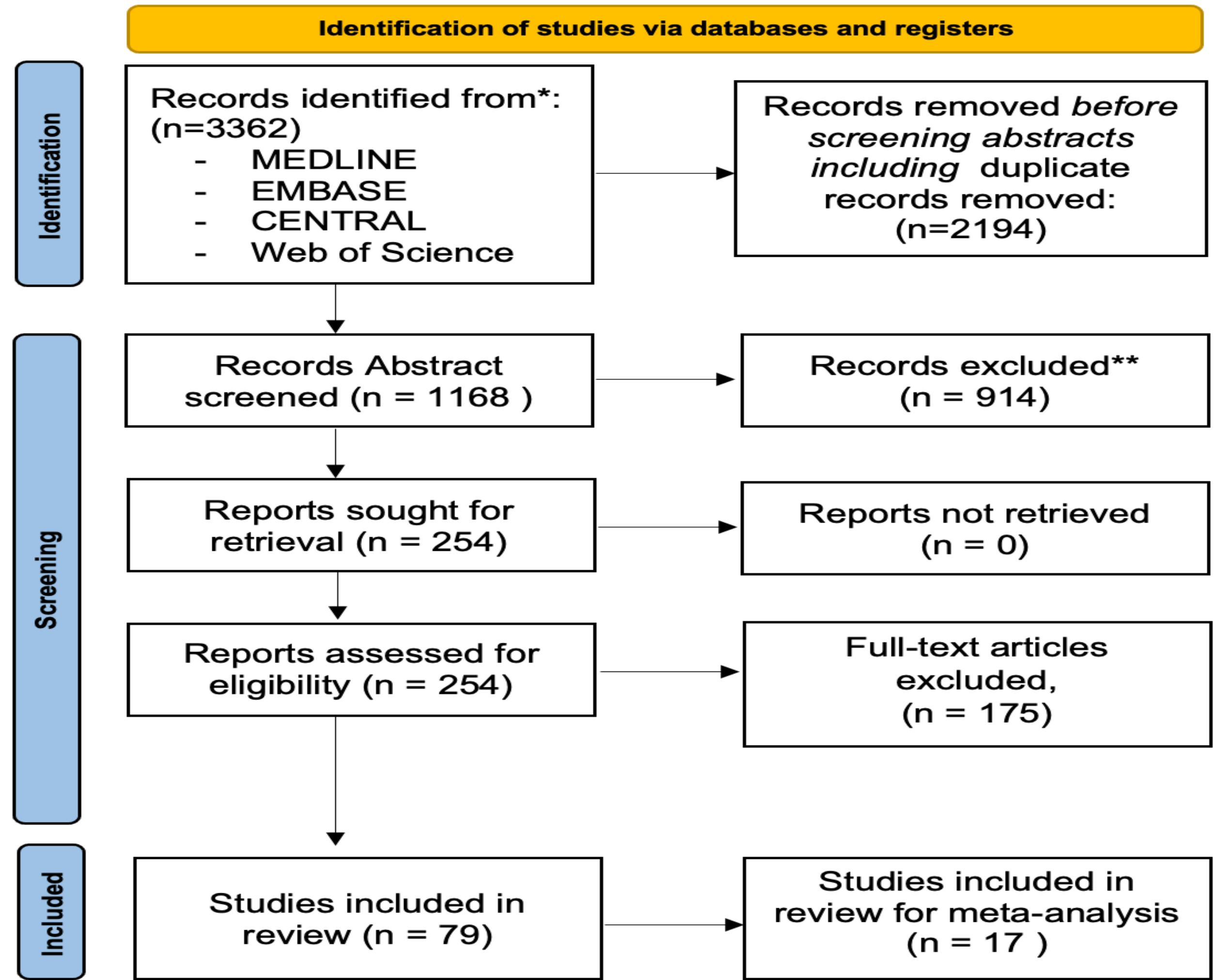


FIGURE 3: PRISMA FLOWCHART



RESULTS

- For the included **17 studies**, **15 reported ISQ values** and **5 studies reported IT**.
Three studies reported both ISQ and IT.
 - Overall survival = 98.7% ISQ and 93.4% IT.**
- For implants placed with **ISQ<60** the survival was **97.2%** and for those placed with **IT<35 91.9%** survived.
 - We found **evidence to support** that an **IT<35 resulted in higher proportion (15.6%)** of implant failures compared to those with **IT≥35 (1.9%) (p=0.015)**.
 - We found **no strong evidence** for a difference in the proportion of failures for an ISQ<60 and ISQ≥60 at placement (**p=0.057**).
 - We found **no evidence** of a difference in the **distribution** of the ISQ (**p=0.18**) or IT (**p=0.76**) values for implants that survived and those that failed.
 - The meta-analysis for ISQ included 6 studies (**Figure 1**) and 2 studies for IT (**Figure 2**).
 - There was **no evidence** to support that an **ISQ of ≥60 or IT≥35 resulted in higher odds of survival (p=0.31, p=0.84)**.