**Introduction**

**Review question / Objective:** Therefore, we aimed to perform a systemic review and meta-analysis to evaluate the effect of vitamin D on major clinical outcomes in this patient population, including an exploration of the supplemental vitamin D-associated influence factors.

**Condition being studied:** Vitamin D supplementation in critically ill patients. The research team comes from the Department of Critical Care Medicine of a tertiary hospital in China, and all the team members have perfect clinical experience in treatments of nebulized antibiotics. Moreover, our team members have published more than 20 meta-analyses, which can guarantee the successful completion of the current research.

**Methods**

**Participant or population:** Adult (≥18 years old) ICU patients.
Intervention: The intervention group received vitamin D regardless of any regimen.

Comparator: The control group receives a placebo or no drug or usual care.

Study designs to be included: RCTs.

Eligibility criteria: We excluded studies conducted on pregnant women and studies conducted in reviews, case reports, case series, post hoc analysis, or studies that did not report any predefined outcomes.

Information sources: Articles available only in abstract form or meeting reports were also excluded.

Main outcome(s): Mortality.

Quality assessment / Risk of bias analysis: We evaluated potential evidence of bias using the Cochrane risk-of-bias tool for RCTs. We assigned a value of high, unclear, low to the following items: (1) sequence generation; (2) allocation concealment; (3) blinding; (4) incomplete outcome data; (5) selective outcome reporting; and (6) other sources of bias.

Strategy of data synthesis: An overall effect estimate for all data as risk ratio (RR)/mean difference (MD) with 95% CI will be calculated. The presence of statistical heterogeneity among the studies by using the Q statistics and the heterogeneity by using the I² statistic was addressed. A p value of less than 0.10 or an I² value of greater than 50% as indicative was considered of substantial heterogeneity. A random-effects model or a fixed-effects model (DerSimonian-Laird) will be chosen when significant heterogeneity or nonsignificant heterogeneity was not observed, respectively. meta-analysis; meta-regression,

Subgroup analysis: proportion of mechanical ventilation.

Sensitivity analysis: None.

Country(ies) involved: China.

Keywords: Vitamin D; critical illness; mechanical ventilation; meta-analysis; mortality.

Contributions of each author:
Author 1 - When-He zheng.
Author 2 - Yan Yao.
Email: 2692125411@qq.com
Author 3 - Hui-Bin Huang.
Email: hhba02922@btch.edu.cn