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Corresponding author:

Junjie Wang

piccolovegeta@sina.com

Author Affiliation: Shanxi Bethune Hospital.

Differences in bone mineral density between high-level runners and controls: A meta-analysis

Hao, Y; Wang, JJ; Sun, L.

ADMINISTRATIVE INFORMATION

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Review Stage at time of this submission - Completed but not published.

Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 17 May 2025 and was last updated on 17 May 2025.

INTRODUCTION

R eview question / Objective Compare bone mineral density between runners and controls.

Condition being studied Runners and inactive controls, untrained individuals or non athletes.

METHODS

Participant or population Individuals were runners in one group and inactive controls, untrained individuals or nonathletes in the other group.

Intervention None.

Comparator BMD or BMC of the bone in the body, such as the lumbar spine and femoral neck.

Study designs to be included Comparative studies.

Eligibility criteria Articles were included if they met the following criteria: (1) target population individuals were runners in one group and inactive controls, untrained individuals or nonathletes in the other group; (2) outcomes—BMD or BMC of the bone in the body, such as the lumbar spine and femoral neck; (3) type of study—comparative studies; and (4) language—English.

Information sources PubMed, EMBASE, Web of Science, and the Cochrane Central Register of Controlled Trials.

Main outcome(s) BMD or BMC of the bone in the body, such as the lumbar spine and femoral neck.

Quality assessment / Risk of bias analysis The Newcastle–Ottawa Scale (NOS) was used to assess the quality of comparative studies.

Strategy of data synthesis RevMan 5.3 software was used to conduct the statistical analyses. The mean difference (MD) and 95% confidence interval(CI) were computed as summary statistics for continuous variables, and pooled summary statistics were calculated with the use of a fixed effects model if the heterogeneity was not significant; otherwise, a random effects model was applied. P < 0.05 was regarded as statistically significant. Statistical heterogeneity was quantified using chi-square (χ 2) and 12 tests, and heterogeneity was considered to exist on the basis of P 50%.

Subgroup analysis After subgroup analysis was conducted, the heterogeneity did not decrease.

Sensitivity analysis After sensitivity analysis wa csonducted, the heterogeneity did not decrease.

Country(ies) involved China.

Keywords bone mineral density; runner; physical activity; meta-analysis.

Contributions of each author

Author 1 - Junjie Wang. Email: piccolovegeta@sina.com Author 2 - Yue Hao. Author 3 - Lin Sun.