Appendix 1**: Assessment of methodological quality of studies**

Study	Objectively definition of VF	The same method of ascertainment for cases and controls	Controls selected from the same population	Clearly stated inclusion criteria or exclusion criteria	Identified time since the last VF	Adjusted for back pain	Score from 6
Jinbayash et al.	**Y**	**Y**	**Y**	**Y**	**N**	**N**	**4**
Burger et al.	**Y**	**Y**	**Y**	**Y**	**N**	**N**	**4**
Greendale et al.	**N**	**Y**	**Y**	**Y**	**Y**	**N**	**4**
Huang et al.	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**6**
O'Neill et al.	**Y**	**Y**	**Y**	**Y**	**Y**	**N**	**5**
Edmond et al.	**Y**	**Y**	**Y**	**Y**	**Y**	**N**	**5**
Chan et al.	**Y**	**Y**	**Y**	**Y**	**N**	**N**	**4**
Ling et al.	**Y**	**Y**	**Y**	**Y**	**N**	**N**	**4**
Silman et al.	**Y**	**Y**	**Y**	**Y**	**N**	**N**	**4**
Ismail et al.	**Y**	**Y**	**Y**	**Y**	**N**	**N**	**4**
Lau et al.	**Y**	**Y**	**Y**	**Y**	**N**	**N**	**4**

Appendix 2: Stage two rejected articles for this systematic review of the association between prevalence of VF and physical activity (n=26)

No control (all patients with VF) (2 studies)
Bergland, A., H. Thorsen, and R. Karesen, Effect of exercise on mobility, balance, and health-related quality of life in osteoporotic women with a history of vertebral fracture: a randomized, controlled trial. Osteoporos Int, 2011. 22(6): p. 1863-71.
Hallberg, I., et al., Health-related quality of life after vertebral or hip fracture: a seven-year follow-up study. BMC Musculoskelet Disord, 2009. 10: p. 135.
All types of fracture were assessed together (hip, wrist, & vertebral) (3 studies)

Wong, A.K., et al., Bone-muscle indices as risk factors for fractures in men: the Osteoporotic Fractures in Men (MrOS) Study. J Musculoskelet Neuronal Interact, 2014. 14(3): p. 246-54.
Nixon, A., et al., Osteoporosis Assessment Questionnaire-Physical Function (OPAQ-PF): a psychometrically validated osteoporosis-targeted patient reported outcome measure of daily activities of physical function. Osteoporos Int, 2014. 25(6): p. 1775-84.
Sornay-Rendu, E., et al., Rate of forearm bone loss is associated with an increased risk of fracture independently of bone mass in postmenopausal women: the OFELY study. J Bone Miner Res, 2005. 20(11): p. 1929-35.
Physical performance was measured objectively (12 studies)
Cheung, C.L., et al., Low handgrip strength is a predictor of osteoporotic fractures: cross-sectional and prospective evidence from the Hong Kong Osteoporosis Study. Age (Dordr), 2012. 34(5): p. 1239-48. (all types)
Tobias, J.H., et al., Use of clinical risk factors to identify postmenopausal women with vertebral fractures. Osteoporos Int, 2007. 18(1): p. 35-43.
Pasco, J.A., et al., Morphometric vertebral fractures of the lower thoracic and lumbar spine, physical function and quality of life in men. Osteoporos Int, 2009. 20(5): p. 787-92.
Siggeirsdottir, K., et al., Effect of vertebral fractures on function, quality of life and hospitalisation the AGES-Reykjavik study. Age Ageing, 2012. 41(3): p. 351-7.
Cawthon, P.M., et al., Physical performance and radiographic and clinical vertebral fractures in older men. J Bone Miner Res, 2014. 29(9): p. 2101-8.
Lyles, K.W., et al., Association of osteoporotic vertebral compression fractures with impaired functional status. Am J Med, 1993. 94(6): p. 595-601.
Macdonald, J.H., et al., Matched-cohort study of body composition, physical function, and quality of life in men with idiopathic vertebral fracture. Arthritis Care Res (Hoboken), 2012. 64(1): p. 92-100.
Schousboe, J.T., et al., Prediction models of prevalent radiographic vertebral fractures among older men. J Clin Densitom, 2014. 17(4): p. 449-57.
Schousboe, J.T., et al., Prediction models of prevalent radiographic vertebral fractures among older women. J Clin Densitom, 2014. 17(3): p. 378-85.

Pluijm, S.M., et al., Consequences of vertebral deformities in older men and women. J Bone Miner Res, 2000. 15(8): p. 1564-72.
Tracy, J.K., et al., Racial differences in the prevalence of vertebral fractures in older men: the Baltimore Men's Osteoporosis Study. Osteoporos Int, 2006. 17(1): p. 99-104.
van der Jagt-Willems, H.C., et al., Why do geriatric outpatients have so many moderate and severe vertebral fractures? Exploring prevalence and risk factors. Age Ageing, 2012. 41(2): p. 200-6.
No adjustment for confounding by age (9 studies)
Cauley, J.A., et al., Prevalent vertebral fractures in black women and white women. J Bone Miner Res, 2008. 23(9): p. 1458-67.
Yamauchi, M., et al., Increased low-density lipoprotein cholesterol level is associated with non-vertebral fractures in postmenopausal women. Endocrine, 2015. 48(1): p. 279-86.
Cho, S.K., et al., The influence of vertebral fracture on the functional disability of patients with rheumatoid arthritis. J Korean Med Sci, 2014. 29(6): p. 859-63.
Schousboe, J.T., et al., Association between prior non-spine non-hip fractures or prevalent radiographic vertebral deformities known to be at least 10 years old and incident hip fracture. J Bone Miner Res, 2006. 21(10): p. 1557-64.
Clark, E.M., R. Gooberman-Hill, and T.J. Peters, Using self-reports of pain and other variables to distinguish between older women with back pain due to vertebral fractures and those with back pain due to degenerative changes. Osteoporos Int, 2016. 27(4): p. 1459-67.
Cooper, C., et al., Screening for vertebral osteoporosis using individual risk factors. The Multicentre Vertebral Fracture Study Group. Osteoporos Int, 1991. 2(1): p. 48-53.
Black, D.M., et al., Prevalent vertebral deformities predict hip fractures and new vertebral deformities but not wrist fractures. Study of Osteoporotic Fractures Research Group. J Bone Miner Res, 1999. 14(5): p. 821-8.
Tsang, S.W., et al., Clinical risk factor assessment had better discriminative ability than bone mineral density in identifying subjects with vertebral fracture. Osteoporos Int, 2011. 22(2): p. 667-74.
Kwok, A.W., et al., Prevalence and risk factors of radiographic vertebral fractures in elderly Chinese men and women: results of Mr. OS (Hong Kong) and Ms. OS (Hong Kong) studies. Osteoporos Int, 2013. 24(3): p. 877-85.

Addendum 3: Prisma 2009 Checklist

Section/topic	#	Checklist item	Reported on page #
TITLE			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	Page 1
ABSTRACT			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	Page 2
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known.	Page 3
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	Page 4
METHODS			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	Page 5
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	Table 1
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	Page 5
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	Page 5
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	Figure 1
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	Page 6
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	Page 5

Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	Page 6
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	Page 6
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I^2) for each meta-analysis.	Page 6

Section/topic	#	Checklist item	Reported on page #
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	Page 6
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	Page 7
RESULTS			
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	Page 8
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	Page 8
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).	Appendix 1
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.	Figure 2, 3, 4, 5
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.	Pages 9, 10, 11
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).	Page 8
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).	Page 8
DISCUSSION			
Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).	Page 12

Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).	Page 13
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	Page 13
FUNDING			
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.	N/A Part of PhD

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