Review Article

Exploring frailty prevalence among adults in Indian healthcare settings: A systematic review and meta-analysis

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Abstract

Frailty is an age-associated state of increased vulnerability due to declines in physiologic systems, leading to compromised ability to withstand stressors. Given India's rapidly aging population, our study aims to estimate the pooled prevalence of frailty and its associated factors in hospital settings. An extensive search was conducted across four databases, up to January 2024. A random-effects model was utilized. To quantify heterogeneity, the I^2 statistic, prediction interval, and the Chi-square-based Q test were employed. Outliers were identified using a Baujat plot and influence analysis. Doi plot, luis furuya kanamori (LFK) index and funnel plot were used to assess publication bias. The current meta-analysis determined a pooled frailty prevalence of 42.3% (95% CI: 34.8%–50.1%) and prefrailty prevalence of 39.8% (95% CI: 30.4%–49.8%), both exhibiting high heterogeneity (I^2 values of 96.9% and 95.3%, respectively). A high degree of variability was indicated by a prediction interval ranging from 9% to 76%, while Egger's test suggested no evidence of publication bias. Our systematic review and meta-analysis, encompassing 6,856 individuals, revealed a considerable prevalence of frailty at 42.3%, underscoring its ubiquity across health spectra and demographics in India.

Keywords: Frail, frailty, meta-analysis, quality of life, systematic review

Introduction

The concept of frailty lacks a universally definitive definition in scientific discourse. However, frailty is theoretically defined as a clinically recognizable state of increased vulnerability resulting from an aging-associated decline in reserve and function across multiple physiologic systems such that the ability to cope with everyday or acute stressors is compromised.[1] Frailty has also been defined by Fried *et al.*[2] as meeting three out of five phenotypic criteria indicating compromised energetics: low grip strength, low energy, slowed walking speed, low physical activity, and/or unintentional weight loss. The presence of one or two criteria in a pre-frail stage identifies a subset with a heightened risk of advancing to frailty.

Frailty has been associated with increased hospitalization and costs.[3] It frequently occurs among older individuals undergoing acute, non-elective hospital admissions and continues to serve as a predictor of mortality, length of hospitalization, and the likelihood of being discharged home. Frailty exacerbated adverse outcomes and diminished the quality of life among hospitalized older patients.[4] In general, frailty seems to serve as a reliable predictor of negative health outcomes.[5] Surgical geriatric patients exhibiting frailty incur increased overall hospital costs, along with an opportunity cost resulting from not undergoing

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surgery in the optimal health state.[6] Frailty assessments present a chance to enhance patient care across diverse healthcare settings. Incorporating frailty-aware care throughout healthcare settings holds the potential to improve healthcare outcomes for older adults.[7] The estimated marginal cost of frailty was observed to be US$10,690.[8] Considering the significant additional costs associated with frailty, the strong correlation between frailty and hospitalization, positive outcomes achievable with frailty-informed care, it becomes imperative to assess the actual prevalence of frailty and its associated factors among hospitalized patients. This particularly important in India, where the decadal growth rate of the elderly population of India currently estimated to be at 41%, and the percentage of elderly population in the country projected to double to over 20% of total population by 2050.[9] Hence, in this study, we tried to summarize available evidence for estimating pooled prevalence of frailty and associated factors, as reported in hospital based studies.

In a landscape where the aging population is steadily increasing, understanding the prevalence and factors associated with frailty becomes paramount for primary care physicians. By synthesizing evidence on frailty prevalence and its correlates, this study equips primary care providers with insights essential for early identification, intervention, and tailored care plans for their patients. Through this meta-analysis, primary care physicians will gain a nuanced understanding of frailty's prevalence and contributing factors, facilitating proactive measures to optimize patient outcomes and promote healthy aging within their communities.

Materials and Methods

We conducted the current systematic review and meta-analysis in adherence with the PRISMA guidelines.[10] The protocol of this current review was registered in the PROSPERO database (CRD42024517452).

Research question and selection criteria

In this current meta-analysis, our primary outcome of interest was to find the prevalence of frailty among adults in India, which was estimated using summary statistics. Our research question was based on the population and outcome criteria. We included studies conducted among adults in hospital settings in India. All of the study designs and the studies that were written or translated into English and from the date of inception to January 16, 2024, were included. We excluded the community-based studies. Studies using secondary data and review articles were also excluded.

Data sources and searches

A comprehensive literature search was conducted across multiple databases, including PubMed, Scopus, EMBASE, and Web of Science, covering all records up to January 16, 2024, to gather articles pertinent to our study. Utilizing a combination of specific keywords such as 'frailty,' 'frail,' and 'India,' alongside Boolean operators like "AND" and "OR" we systematically filtered the literature. This approach was further refined by the inclusion of MeSH terms, marked with an asterisk, to enhance the search accuracy, as outlined in Supplementary Figure 1. The aim was to maintain a broad search strategy to maximize the capture of relevant studies. Additionally, we examined the bibliographies of selected articles and related reviews to uncover any additional studies of interest. The collected data from these searches were then organized using the Rayyan.ai software, facilitating the review process and the removal of duplicate entries. The screening process involved an initial review of titles followed by an examination of abstracts by two independent reviewers to determine study eligibility. Articles deemed relevant at this stage were then managed using Mendeley Desktop V1.19.5 for citation tracking and further detailed analysis. Only those studies that met our predefined inclusion criteria proceeded to the data extraction phase.

Quality assessment

The quality of the eligible studies was evaluated using the Joanna Briggs Institute (JBI) Critical Appraisal Checklist for Prevalence Studies.[11] Based on their scores, studies were classified into three categories: scores from 1 to 3 were deemed of poor quality, scores from 4 to 6 indicated fair quality, and scores from 7 to 9 suggested good quality. A higher score signifies a reduced risk of bias, whereas a lower score suggests an increased risk of bias.

Data analysis

In our analysis, STATA software (version 18, STATA Corp.) was utilized for statistical computation. The combined estimates of the prevalence rates for frailty and pre-frailty were presented with 95% CIs. We applied the random-effects model, employing the restricted maximum likelihood (REML) method to incorporate the potential variability among studies. Heterogeneity was quantified using the I^2 statistic and the Chi-square-based Q test. The outliers in the study were identified by a Baujat plot and diagnostic plot followed by a leave-one-out meta-analysis. Sensitivity analysis was conducted to ensure the robustness of our findings, where studies deemed to be of lower quality were omitted. Subgroup analyses were performed to investigate the sources of heterogeneity, categorizing studies by gender, study tool, and disease type. Publication bias was evaluated using doi plot, funnel plot visualizations, and the presence of small-study effects was statistically tested using Egger's regression test, with a significance threshold set at $P < 0.05$.

Ethical consideration

This systematic review and meta-analysis consolidated data from studies that have been previously published. Registration of the review protocol was completed in PROSPERO, ensuring transparency and adherence to predefined objectives and methodologies. We systematically searched and retrieved relevant literature from four major databases.[12] Given that our analysis was restricted to the use of published data, ethical approval was not a requirement for this review.

Results

Search and screening results

A comprehensive search across four databases yielded a total of 830 articles: PubMed 344, Scopus 221, Embase 176, and Web of Science 89. Initial deduplication processes eliminated 477 duplicate entries, resulting in 353 articles. These were subjected to a preliminary screening based on title and abstract, leading to the exclusion of 293 articles. Consequently, 60 articles were selected for full-text review. Of these, full-text versions were not available for 3 articles. A rigorous eligibility assessment further excluded 36 articles that did not meet the predefined inclusion criteria. Therefore, 21 articles were ultimately deemed suitable for the final systematic review and meta-analysis. The detailed selection methodology is graphically depicted in the PRISMA flow diagram, presented in Figure 1.

Quality assessment

The quality assessment of the included studies is summarized in Table 1. Of the 21 studies evaluated, 18 (85.7%) were deemed to be of good quality and 3 (14.3%) of fair quality [Table 1].

Characteristic features of the included studies

The composition of the patient cohorts across the various studies encompassed in the systematic review is summarized in Table 2, which captures data spanning from 2012 to 2024. The methodologies adopted in these studies were predominantly cross-sectional ($n = 17$), constituting 81% of the total. The study designs also included three cohort studies and one case-control study. The sample sizes across these studies exhibited a broad range, with the smallest cohort consisting of 25 individuals in the research by Khan *et al.*,[32] and the largest cohort encompassing 2214 participants in the study by Rao *et al.*[19] The assessment tools utilized to determine the frailty of the subjects varied, with the Fried phenotype being employed in approximately 43% of the studies. Other scales such as the Clinical Frailty Scale ($n = 3$), the FRAIL questionnaire ($n = 3$), and the Liver Frailty Index ($n = 2$) were utilized in other studies. The patient demographics within these studies were diverse, most of them (n = 9) focusing on

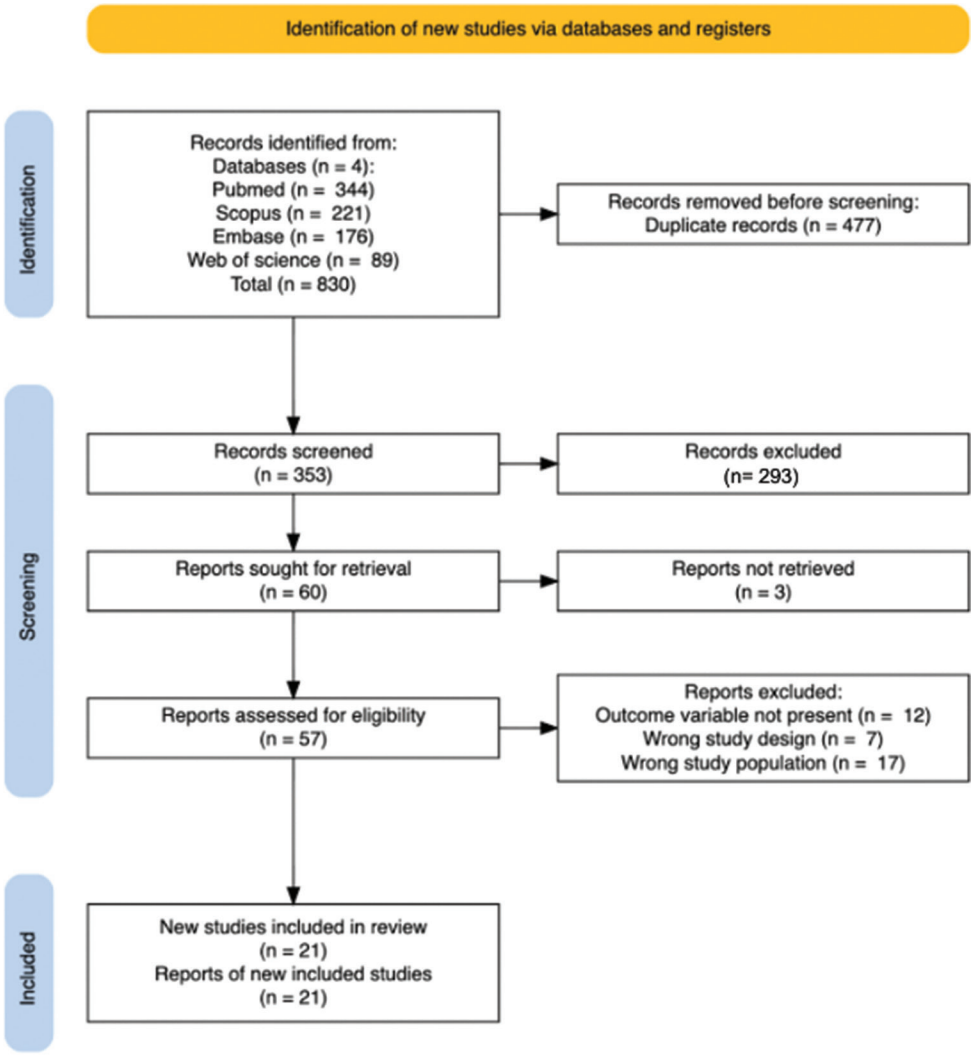

Figure 1: PRISMA chart

Table 1: Assessment of quality of studies by JBI critical appraisal checklist for prevalence studies

Author (Year)	Was the sample frame appropriate to address the target population?	Were study participants sampled in an appropriate way?	Was the sample size adequate?	Were the study subjects and the setting described in detail?	Was the data analysis conducted with sufficient coverage of the identified sample?	Were valid methods used for the identification of the condition?	Was the condition measured in a standard, reliable way for all participants?	Was there an appropriate statistical analysis?	Was the response rate adequate, and if not, was the low response rate managed appropriately?	Total Score	Quality of study
Dutta *et al.* (2024)[13]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	9	Good
Kalaiselvan *et al.* (2023)[14]	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	7	Good
Khan *et al.* (2023)[15]	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	8	Good
Mangalesh *et al.* (2023)[16]	Yes	Yes	Yes	Yes	No	Yes	Yes	No	Yes	7	Good
Meratwal *et al.* (2023)[17]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	9	Good
Nathiya *et al.* (2023)[18]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	9	Good
Rao *et al.* (2023)[19]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	9	Good
Vijayaraghavan *et al.* (2023)[20]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	9	Good
Kumar *et al.* (2022)[21]	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	7	Good
Singh *et al.* (2022)[22]	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8	Good
Soni *et al.* (2022)[23]	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	6	Fair
Aggarwal *et al.* (2021)[24]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	8	Good
Bhat *et al.* (2021)[25]	No	No	No	No	No	Yes	Yes	Yes	Yes	4	Fair
Gunasekaran *et al.* (2021)[26]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	8	Good
Singh *et al.* (2021)[27]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	8	Good
Aggarwal (2020)[28]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	9	Good
Gopinathan *et al.* (2020)[29]	Yes	No	NA	Yes	Yes	Yes	Yes	Yes	No	9	Good
Singhal *et al.* (2020)[30]	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	7	Good
Swain *et al.* (2019)[31]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	8	Good
Khan *et al.* (2016)[32]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	9	Good
Khandelwal *et al.* (2012)[33]	Yes	Yes	No	No	Yes	Yes	Yes	Yes	No	6	Fair

Table 2: Baseline characters of the studies included in meta-analysis

Author (year of publication)	Disease condition	Study tool (How frailty was measured)	Total Sample Size	Number of participants having frailty	Number of participants having pre-frailty
Dutta *et al.* (2024)[13]	COPD	Fried's Phenotype	150	77	49
Kalaiselvan *et al.* (2023)[14]	ICU patients	Clinical Frailty Scale (CFS)	137	53	-
Khan *et al.* (2023)[15]	General OPD patients	FIRE-MADE	250	204	-
Mangalesh *et al.* (2023)[16]	Myocardial infraction	Clinical Frailty Scale (CFS)	402	131	-
Meratwal *et al.* (2023)[17]	General OPD patients	Fried's Phenotype	288	93	93
Nathiya *et al.* (2023)[18]	liver cirrhosis	Liver Frailty Index	138	62	-
Rao *et al.* (2023)[19]	Cancer patients	Clinical Frailty Scale (CFS)	2214	1324	-
Vijayaraghavan *et al.* (2023)[20]	ICU patients	Clinical Frailty Scale (CFS)	838	166	-
Kumar *et al.* (2022)[21]	General OPD patients	Fried's Phenotype	149	87	-
Singh *et al.* (2022)[22]	Liver cirrhosis	Liver Frailty Index	116	50	-
Soni *et al.* (2022)[23]	COPD patients	FRAIL Questionnaire	300	65	77
Aggarwal *et al.* (2021)[24]	General OPD patients	Fried's Phenotype	424	67	263
Bhatt *et al.* (2021)[25]	Diabetics for > = 4 years	FRAIL Questionnaire	60	37	19
Gunasekaran *et al. et al.* (2021)[26]	General OPD patients	BADL & IADL	324	101	198
Singh *et al.* (2021)[27]	Heart failure	Fried's Phenotype	210	93	111
Aggarwal *et al.* (2020)[28]	Acute coronary syndrome	Fried's Phenotype	100	44	26
Gopinathan *et al.* (2020)[29]	Patients on dialysis	Physical Performance Measurement	39	22	-
Singhal *et al.* (2020)[30]	General OPD patients	Fried's Phenotype	100	42	-
Swain *et al.* (2019)[31]	General OPD patients	Edmonton Frail Scale	342	126	118
Khan *et al.* (2016)[32]	Noncardiac major surgery	Fried's Phenotype	25	14	-
Khandelwal *et al.* (2012)[33]	Hospitalised patients	Fried's Phenotype	250	83	-

#FRAIL questionnaire:[35] Short five-question assessment of fatigue, resistance, aerobic capacity, illnesses, and loss of weight. $FIRE MADE:[15] Frailty Index in Rural Elderly – Mental Status, Activities of Daily Living, Depression and Events

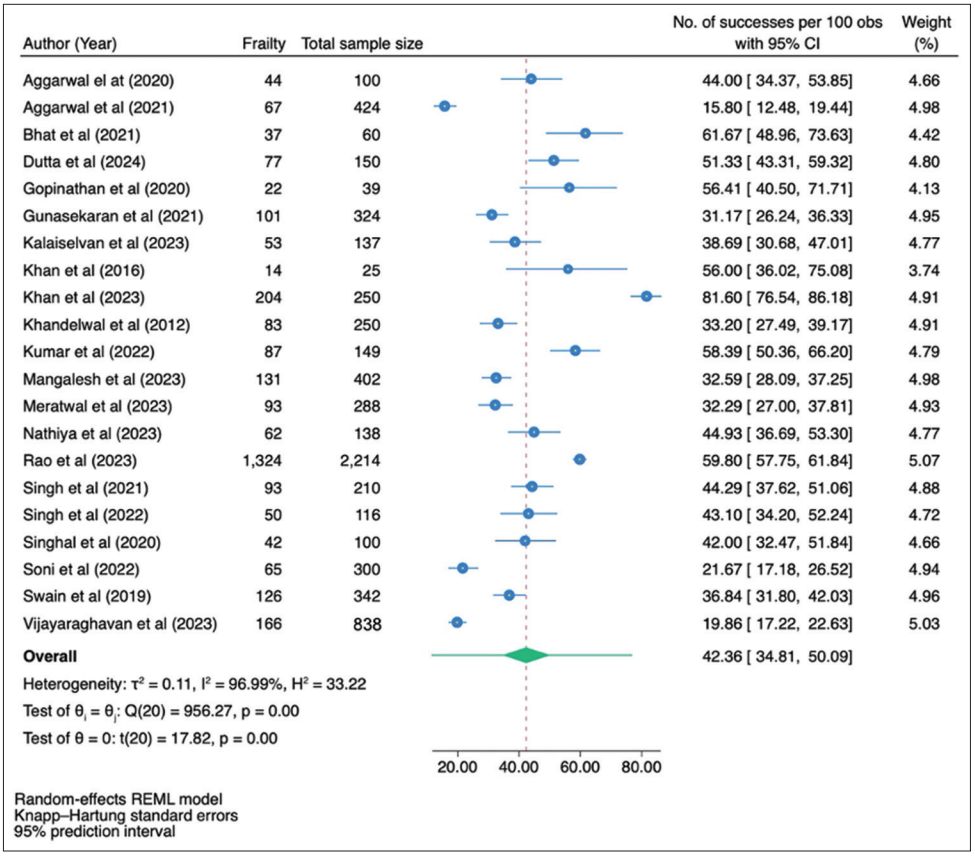

Figure 2: Forest plot of meta-analysis of prevalence of frailty among Indian adults in healthcare settings

general patients within hospital settings. Noncommunicable disease (NCD) patients were the subject of six studies, while two studies concentrated on individuals with liver conditions. Studies involving patients with terminal illnesses numbered four. Notably, the prevalence of the conditions under investigation fluctuated significantly across the studies, with a minimum reported prevalence of 15.8% in the study by Aggarwal *et al.* and a maximum of 81.6% in the study by Khan *et al.*[15,24]

Pooled estimate of frailty

A comprehensive meta-analysis was conducted to evaluate the prevalence of frailty among adults in healthcare settings. The analysis comprised 6,856 participants, out of which 2,941 were identified as frail. The pooled prevalence was 42.3%, with a 95% CI of 34.8% to 50.1%. Moreover, a prediction interval ranging from 9% to 76% was reported, indicating a potential wide variation in the actual prevalence of frailty across different studies [Figure 2]. The study also revealed pronounced variability in findings, as evidenced by an I^2 value of 96.9% ($P < 0.01$). It points to real disparities in frailty rates rather than random chance. Therefore, the analysis was conducted using a random-effects model. The pooled prevalence for prefrailty was 39.8%, with a CI of 30.4% to 49.8%. This also revealed high heterogeneity ($I^2 = 95.3\%$). [Figure 3]

The funnel plot shows an asymmetric funnel. The LFK index was −0.52 in the doi plot, which revealed there might be a small study effect or publication bias. [Figure 4a and b] Egger's test showed a beta1 value of 3.16 with a standard error of 1.7 ($P = 0.06$). It suggested that there is no small study effects or publication bias in the current meta-analysis.

Meta-regression

The meta-regression analyses explored the impact of various covariates such as mean age and sample size. Both the covariates did not show a clear impact on effect sizes [Supplementary Figure 2].

Influence analysis

The Baujat and diagnostic plots were made to identify studies contributing to heterogeneity [Supplementary Figures 3 and 4]. The plot highlighted study by Khan *et al.*[15] as having a substantial impact on the overall heterogeneity and effect estimates. Although A leave-one-out sensitivity analysis demonstrated that the removal of any single study did not significantly alter the overall effect size, underscoring the stability and reliability of our pooled estimate [Supplementary Figure 5]. The forest plot was made after the removal of Khan *et al.*,[15] where it was found that the pooled estimate of frailty was 40% (95% CI: 34-47) and the heterogeneity had decreased to 96.1% [Supplementary Figures 6].

Subgroup analysis

In conducting our meta-analysis, the variability in effect sizes

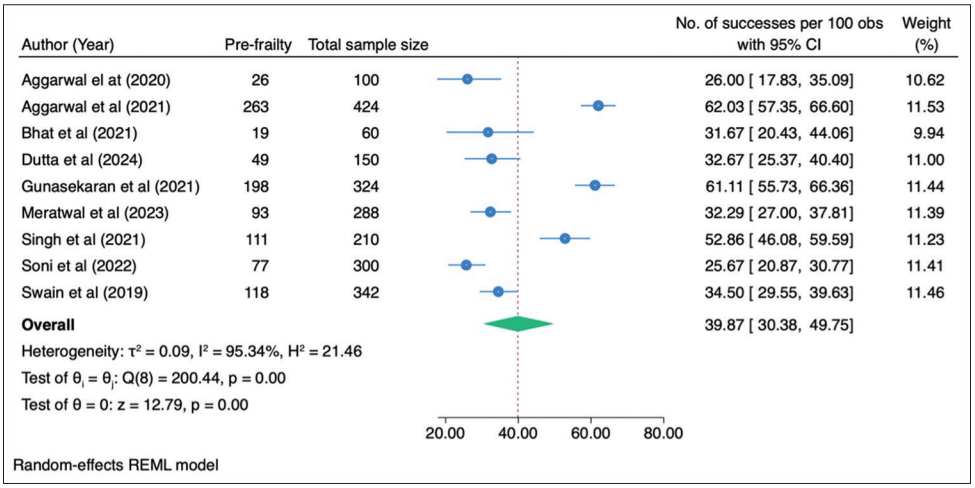

Figure 3: Forest plot of meta-analysis of prevalence of pre-frailty

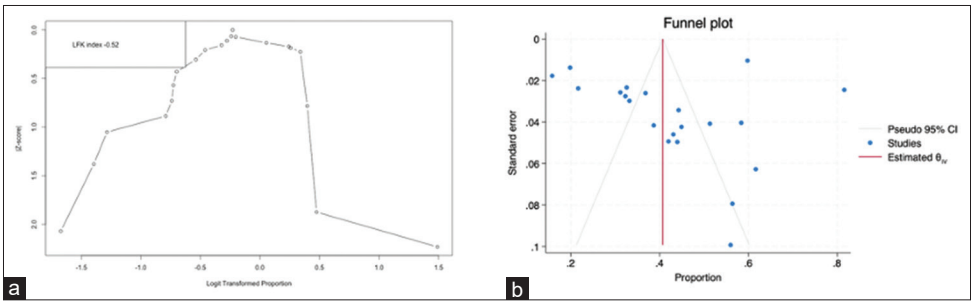

Figure 4: Publication bias (a) LFK index (b) Funnel plot

was pronounced, particularly within certain patient subgroups. Critically ill patients had a pooled prevalence of 42.7%, with a CI ranging notably from 14.9% to 73.1%, reflecting the diverse clinical scenarios and frailty measurements. NCD patients presented a more consistent effect size of 41.6%, yet with a broad CI, suggestive of underlying variability. General patients showed an effect size of 42.4%, possibly indicating a more homogeneous experience of frailty within this group. Notably, the liver cirrhosis subgroup stood out with consistent study results, displaying no heterogeneity and suggesting a uniform effect size of 44.1% across research. These subgroup analyses underscore the multifaceted nature of frailty across different medical conditions and the necessity of a nuanced interpretation of its prevalence in healthcare settings [Figure 5]. Gender-based subgroup analyses in our meta-analysis revealed a high degree of heterogeneity for both female and male groups, with I^2 values of 95.16% and 96.95%, respectively. The estimated effect size for females was 45.36 (95% CI: 32.16, 58.89), while for males, it was slightly lower at 44.05 (95% CI: 34.07, 54.26) [Figure 6]. In

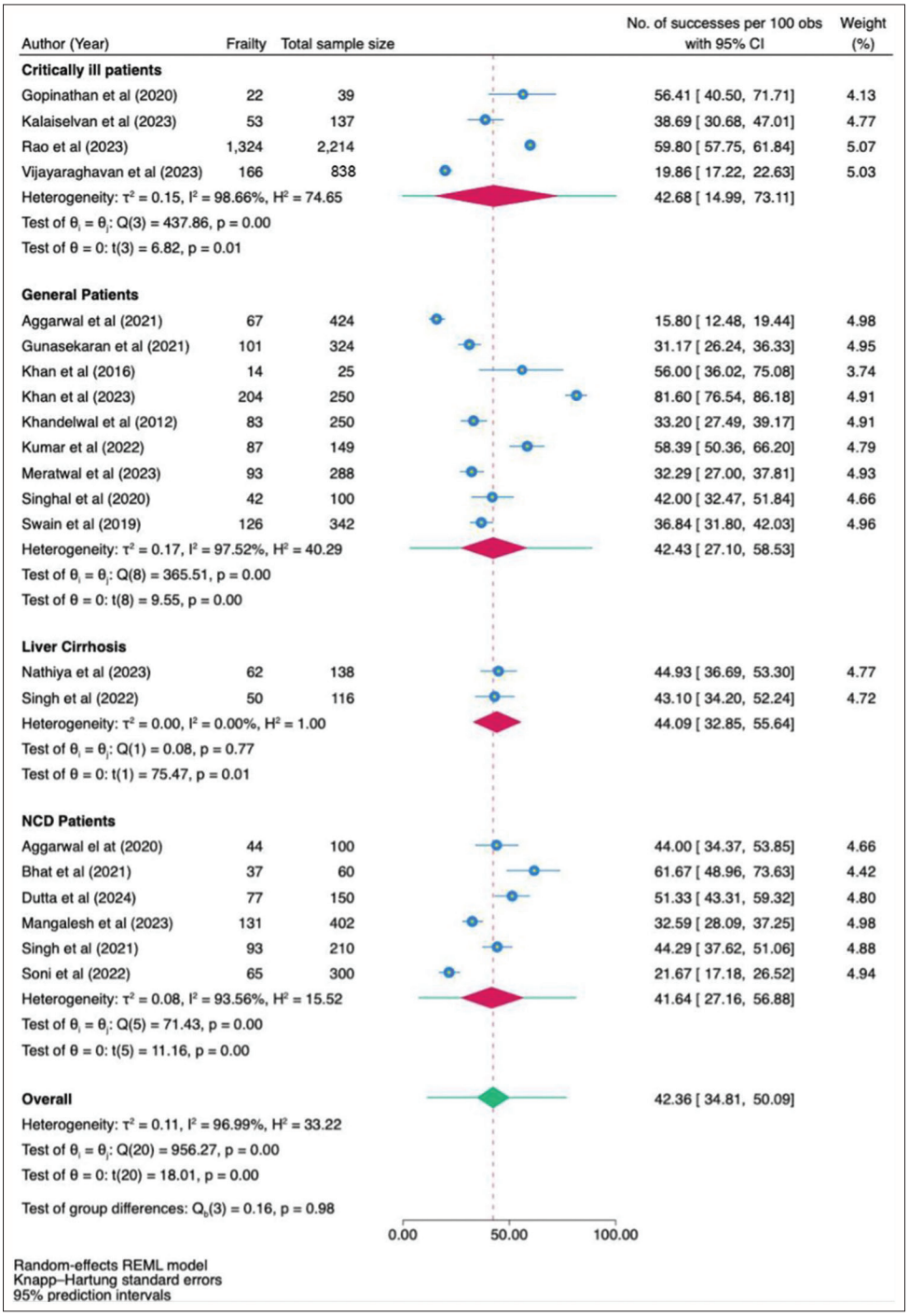

Figure 5: Forest plot showing sub-group analysis among various diseased population

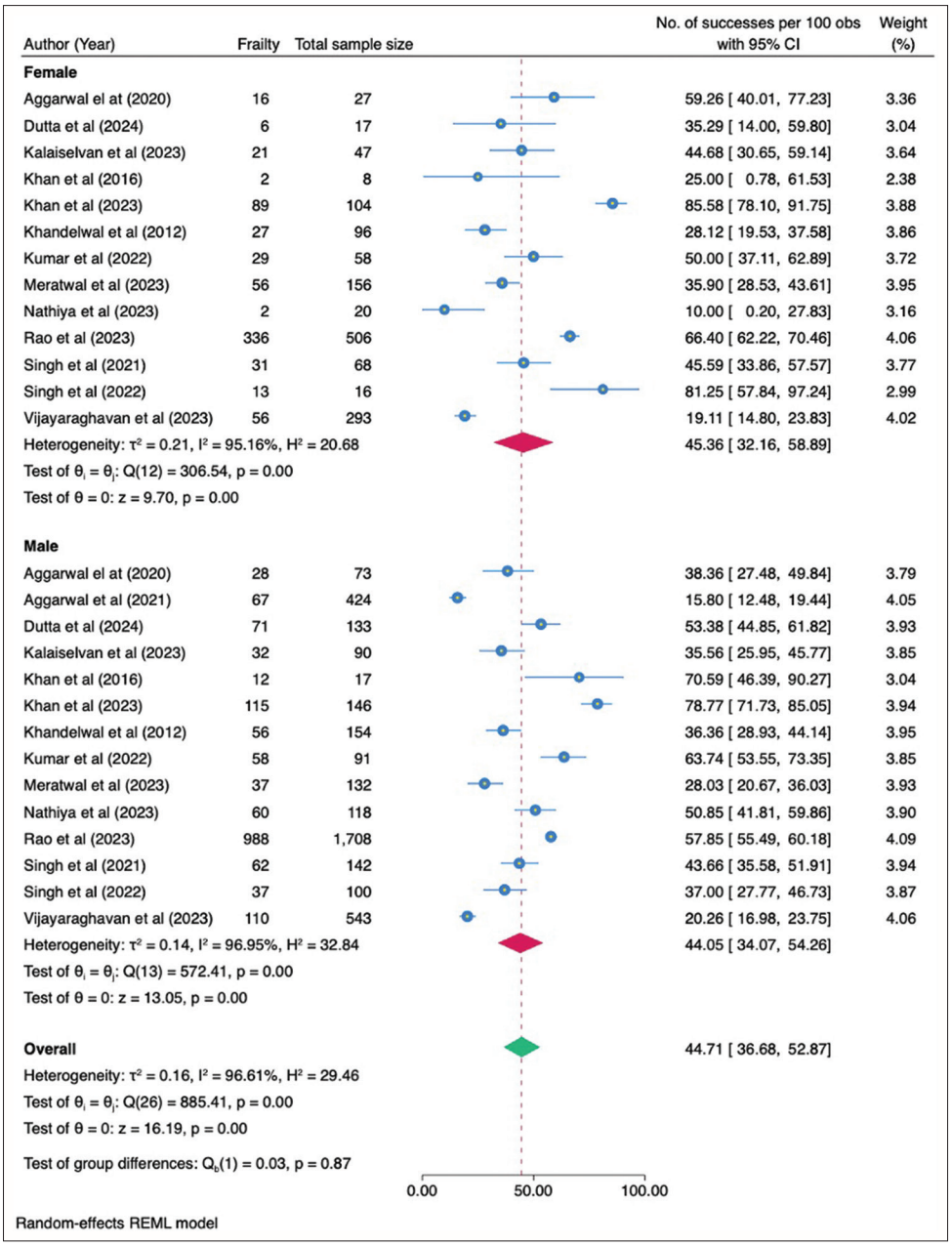

Figure 6: Forest plot showing gender-wise sub-group analysis

this meta-analysis, substantial heterogeneity was observed when assessing frailty prevalence with different measurement tools. The Clinical Frailty Scale demonstrated a high degree of variation (I^2 =99.39%), as did the FRAIL Questionnaire (I^2 =97.13%). Fried's phenotype showed a relatively more stable effect size, though still with notable heterogeneity (I^2 =93.16%). The category labeled "Others", encompassing various assessment tools, exhibited significant variability (I^2 =97.43%). In contrast, the Liver Frailty Index reported a homogeneous effect size (I^2 =0%). Tests for group differences across diagnostic tools, genders, and patient types showed no significant disparities, indicating a consistent clinical presentation of frailty across these factors (Q = 1.01, P = 0.91; Q = 0.03, P = 0.87; Q = 0.16, P = 0.98, respectively) [Figure 7].

Discussion

In our extensive systematic review and meta-analysis, which encompassed 6,856 participants across various healthcare settings, we identified a notable frailty prevalence rate of 42.3%, (95% CI: 34.8%−50.1%). This analysis also highlighted significant variability, as evidenced by a prediction interval extending from 9% to 76%. Similarly, the occurrence of prefrailty was significant, observed at a rate of 39.8% with a CI between 30.4% and 49.8%, and was characterized by substantial heterogeneity (I^2 =95.3%). Despite asymmetry in the funnel plot, no small study effects or publication bias were identified by Egger's test. The robustness of our overall pooled prevalence was further corroborated by sensitivity analysis, affirming its reliability.

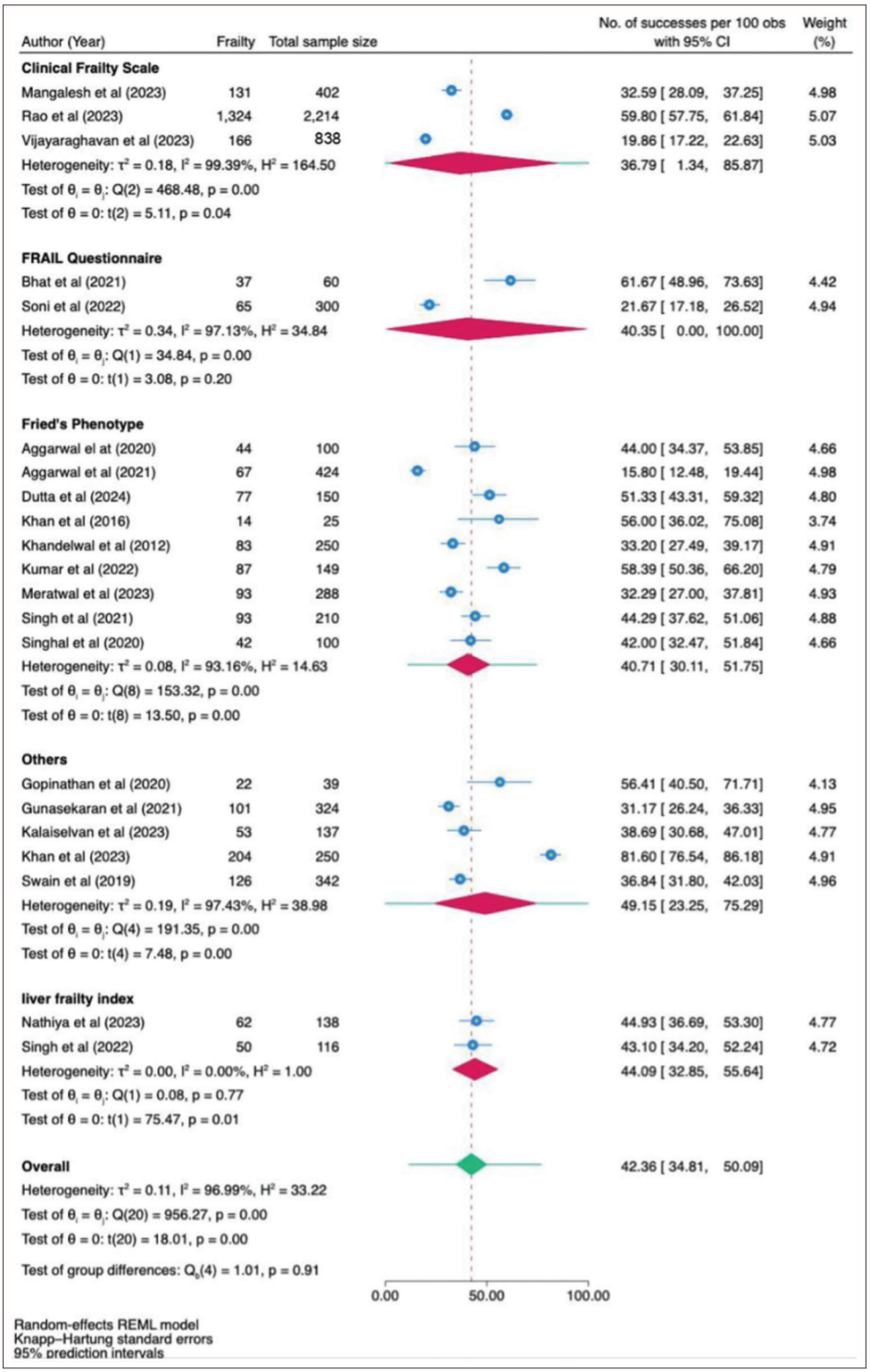

Figure 7: Forest plot showing sub-group analysis according to assessment tool used

The observed heterogeneity was pronounced among the subgroups of studies employing varied tools for measuring frailty, which underscores the imperative for discerning interpretation. The Clinical Frailty Scale, which is contingent on clinical discernment and overall functionality, offers a qualitative assessment of frailty status.[34] Conversely, the Frail Questionnaire and the Fried Frailty Phenotype anchor their assessment on explicit criteria and quantitative evaluations; the former accords primacy to self-reported symptoms, while the latter concentrates on physical markers such as unintended weight loss and grip strength.[35,36] The Liver Frailty Index, which comprises three performance-oriented tests—grip strength, chair stands, and

balance—is specifically crafted for patients with cirrhosis to objectively gauge physical function, an essential predictor of health-related outcomes[37]

Despite the anticipated diversity in health conditions, our subgroup analyses reveal a consistent prevalence of frailty across different patient groups, including those with general ailments, critical illnesses, liver cirrhosis, and non-communicable diseases. This finding suggests that frailty, a condition of increased vulnerability often accompanying aging and characterized by diminished physiological reserve, may be a common factor across various health conditions, and not exclusively linked to the presence of chronic diseases or comorbidities. The implication is a universal aspect of frailty that is crucial to consider in the health management of all patient populations, particularly the elderly.[38]

Our gender-specific subgroup analyses showed significant heterogeneity within both male and female groups, yet indicated a comparable overall prevalence of frailty between the genders. Considering the inverse relationship between frailty and quality of life, this analysis gains importance in light of the differing life expectancies for men and women in India.[39]

Frailty has been substantiated as a contributing factor to a range of morbidities, notably acting as a substantial risk factor for falls among the elderly.[40] It has been observed to be more prevalent among stroke patients.[41] Frailty was associated with an increased risk of 30-day mortality.[42] In an Indian prospective registry-based cohort study, the presence of frailty was significantly associated with increased odds of ICU and hospital mortality. Furthermore, frailty was linked with a heightened incidence of severe acute kidney injury, a greater need for non-invasive ventilation, the use of vasopressors, and the initiation of kidney replacement therapy.[22] These associations accentuate the imperative for public health initiatives in India to address the impact of frailty, considering its significant implications for health outcomes and resource utilization.

In light of our findings, primary care physicians are equipped with valuable insights into the prevalence and heterogeneity of frailty among diverse patient populations. This understanding underscores the importance of incorporating frailty assessments into routine clinical practice, enabling early identification and targeted interventions to mitigate adverse health outcomes. By recognizing frailty as a universal factor transcending specific health conditions, family physicians are empowered to adopt a proactive approach towards holistic patient care, particularly among the elderly demographic where frailty poses significant challenges to quality of life and healthcare resource utilization. Our gender-specific subgroup analyses further emphasize the need for tailored interventions, acknowledging the unique health disparities and life expectancies among male and female patients in India.

Limitations

Our investigation acknowledges certain limitations. The scope of the study did not extend to the inclusion of grey literature. Additionally, we observed significant heterogeneity, which is attributable to a multitude of factors. We attempted to mitigate this through subgroup analyses, leave-one-out analyses, and the employment of a random-effects model. The absence of individual-level data precluded a deeper examination of the inherent distinctions among the sample populations. Moreover, our screening process for abstracts may have inadvertently excluded relevant studies where frailty, though not the central focus, was still quantified, such as instances where it was considered a covariate.

Conclusion

Our systematic review and meta-analysis, which included 6,856 participants from varied healthcare settings, has determined a significant frailty prevalence of 42.3%, revealing its widespread nature across different health conditions and consistent presence among both genders in India. The analysis underscores frailty as a universal health concern, particularly in the elderly, associated with increased risk of falls, higher morbidity, and mortality rates, which necessitates its incorporation into routine healthcare assessments and management strategies.

Way forward

Frailty can be a robust risk stratification paradigm. It should be assessed whether the current healthcare systems are equipped to handle the existing burden of frailty, the complex needs of frail individuals, and successful integration into clinical practice faces challenges such as lacking international standards, uncertain interventions, and potential stigmatization risks. Future research should delve into the factors contributing to the observed disparities and explore effective preventive measures and interventions to mitigate the impact of frailty on the health and well-being of this population.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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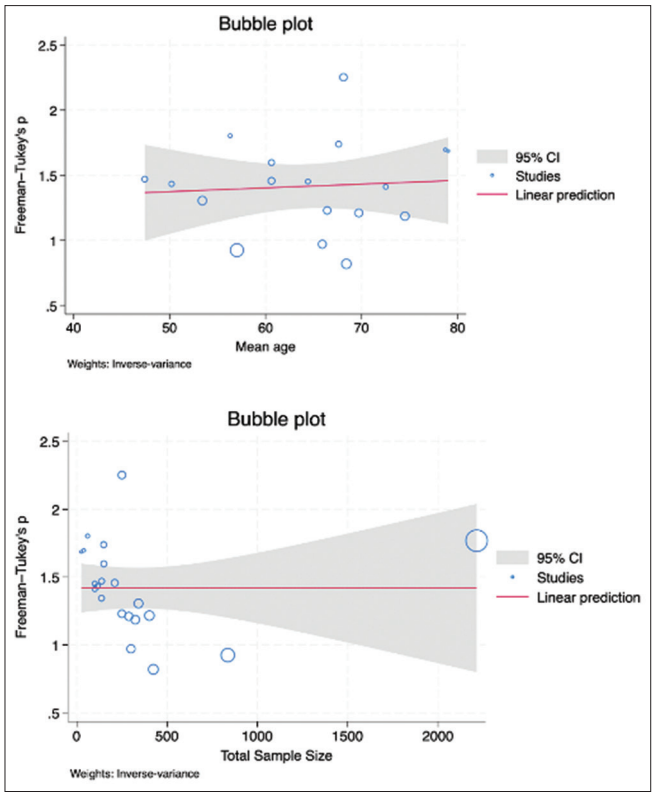
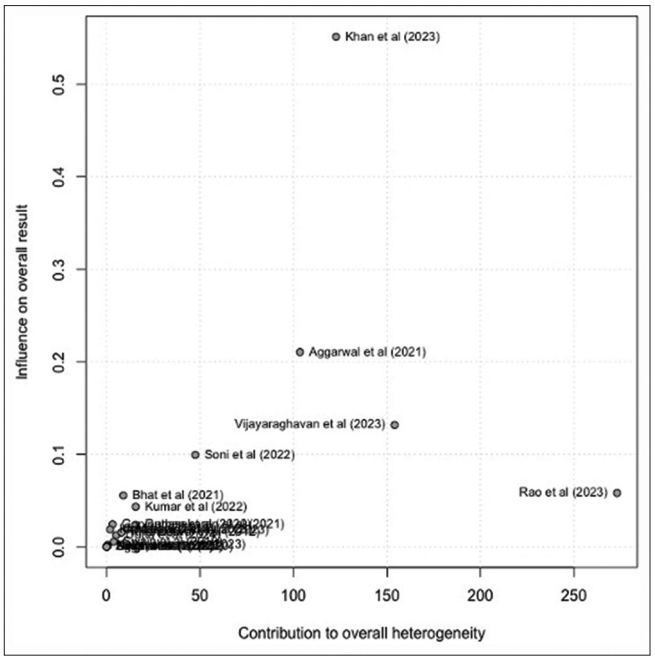
Supplementary Figure 1: Search strategy

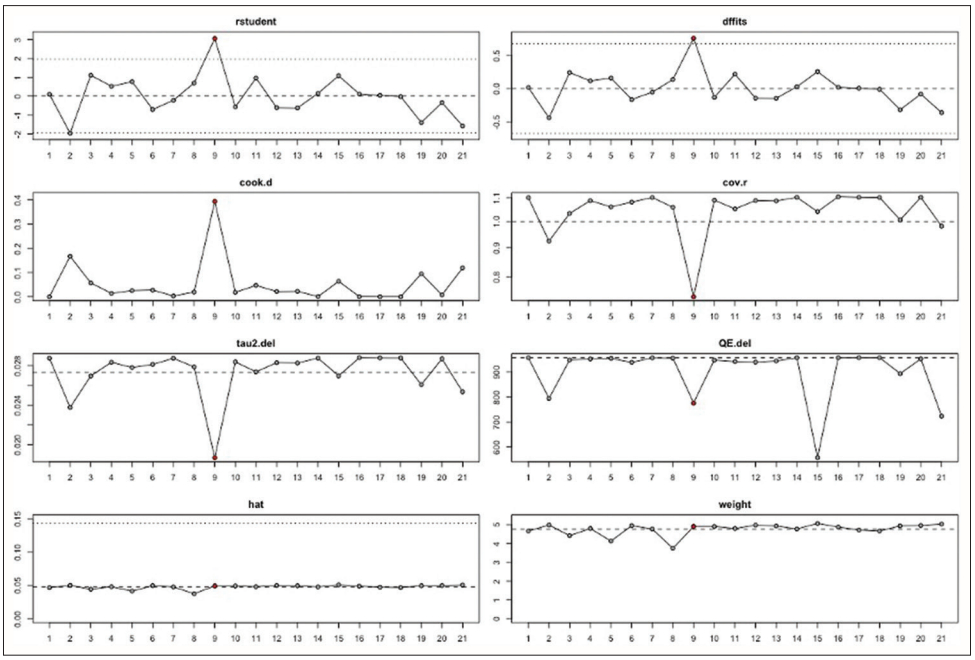
Database	No	Search Query	Results
		EMBASE	
	#1	'frail elderly'/exp OR 'frail elderly' OR frai*:ab, ti OR frail: ab, ti OR frailty: ab, ti	60,692
	#2	'india'/exp OR india: ab, ti OR indias: ab, ti	258,325
	#3	#1 AND #2	176
		PubMed	
	#1	"frail elderly"[MeSH Terms] OR "frail elderly"[MeSH Terms] OR "frail elderly"[MeSH Terms] OR "frail elderly"[MeSH Terms] OR "frail elderly"[MeSH Terms] OR "frai*"[Title/Abstract] OR "frail"[Title/Abstract] OR "frailty"[Title/Abstract]	42,592
	#2	"india"[MeSH Terms] OR "india"[All Fields] OR "india's"[All Fields] OR "indias"[All Fields]	806,679
	#3	#1 AND #2	344
		Scopus	
	#1	(TITLE-ABS-KEY ("frail elderly") OR TITLE-ABS-KEY (frai*) OR TITLE-ABS-KEY (frail) OR TITLE-ABS-KEY (frailty))	59,568
	#2	(TITLE-ABS-KEY (india) OR TITLE-ABS-KEY (india's) OR TITLE-ABS-KEY (indias))	601,854
	#3	#1 AND #2	211
		Web of Science	
	#1	(((TS=(frail elderly)) OR TS=(frai*)) OR TS=(frail)) OR TS=(frailty)	43,923
	#2	((TS=(india)) OR TS=(india's)) OR TS=(indias)	219,645
	#3	#1 AND #2	89



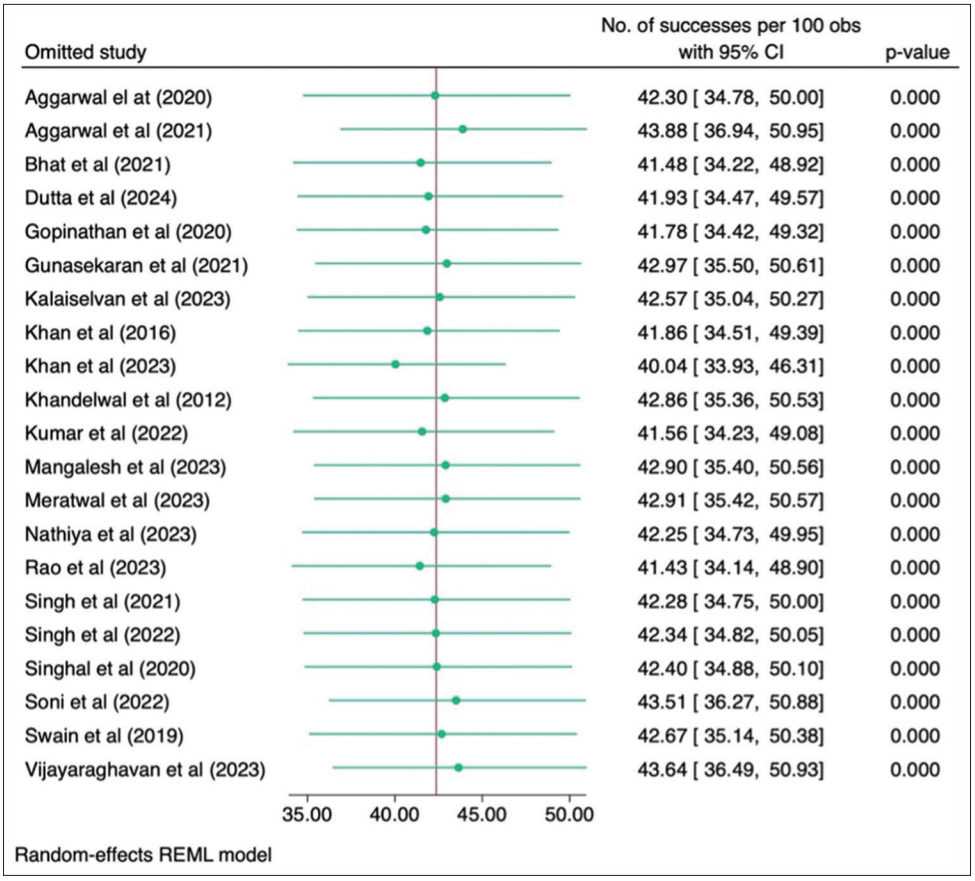
Supplementary Figure 2: Meta-regression showing impact of mean age and sample size



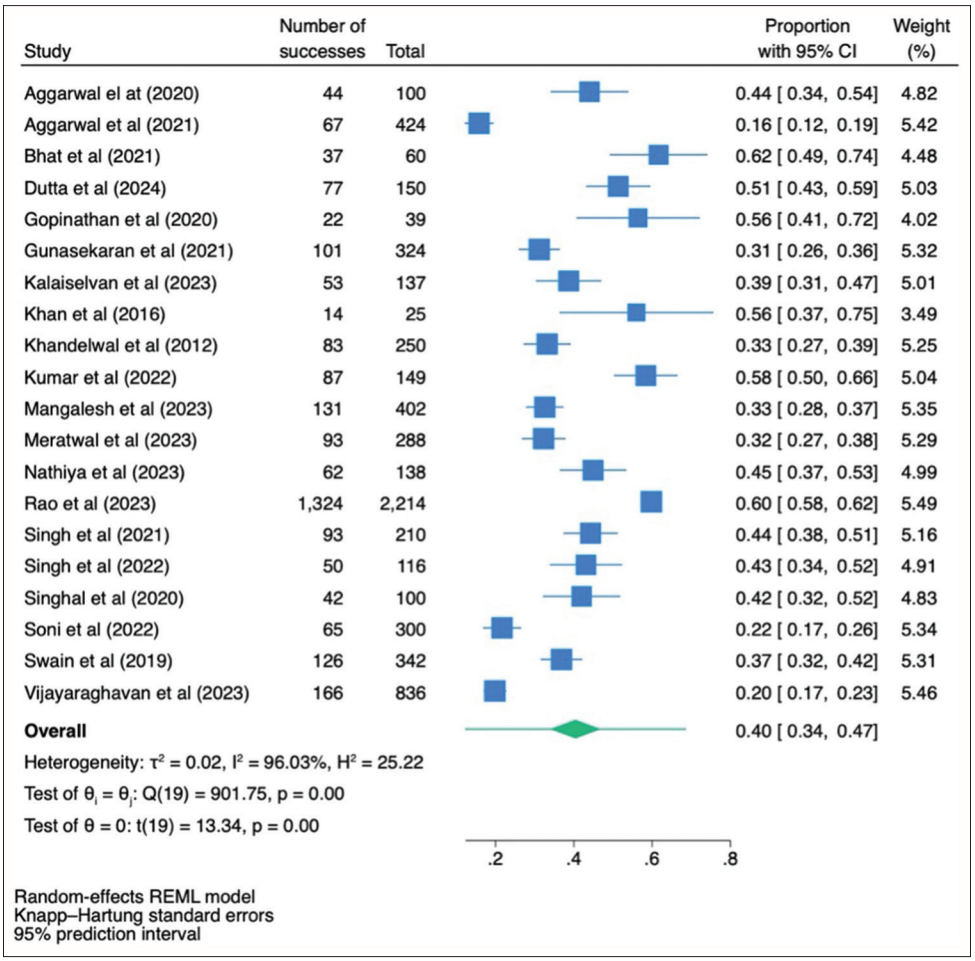
Supplementary Figure 3: Baujat plot



Supplementary Figure 4: Diagnostic plots for assessing influence and outliers in meta-analysis



Supplementary Figure 5: Leave-one-out sensitivity analysis for prevalence of frailty



Supplementary Figure 6: Forest plot after removal of study Khan *et al.*, for influence analysis