# A Systematic Review and Meta-Analysis of the Burdens of Vitiligo in the MENA Region: Prevalence, Comorbidities, and Impact on Quality of Life

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## OBJECTIVE

**This systematic review and meta-analysis assess vitiligo prevalence, comorbidities, types, and quality-of-life (QoL) impact among the Middle East and North Africa (MENA) patients to guide future research and clinical management.**

## CONCLUSIONS

**Vitiligo is a significant public health concern in MENA region, with a notable prevalence and substantial impact on patients' quality of life.**

**Beyond its dermatological effects, it is linked to multiple comorbidities, particularly psychological distress and depression.**

**The disease also carries a social burden, with stigma and limited public awareness affecting patients' well-being, underscoring the need for improved management strategies.**

**Funding:** The study was funded by AbbVie Biopharmaceuticals GmbH. AbbVie contributed to the design, analysis, and interpretation of data; in reviewing and approval of final version based on the authors' input and direction. No honoraria or payments were made for authorship.

**Disclosure:** MTa, SHa, TH, TA, and YN are full-time employees of AbbVie Biopharmaceuticals GmbH and may hold company shares; MT, SH, and SM are employees of Stellar Consulting MEA, Dubai, UAE; SM is also affiliated with the Department of Pharmaceutical Technology, German University in Cairo. SH also is affiliated with Department of Clinical Pharmacy, German University in Cairo, Cairo, Egypt.

**Acknowledgments:** The authors would like to thank all contributors for their commitment and dedication. The authors would like to acknowledge the writing assistance provided by Stellar Consulting MEA and statistical analysis support provided by Stellar Consulting MEA which were funded by AbbVie. The authors are fully responsible for all content and editorial decisions, were involved at all stages of Abstract development, and have approved the final version.

## INTRODUCTION

• Despite the significant burden of vitiligo in the Middle East and North Africa (MENA) region, there remains a gap in understanding the full extent of its prevalence and associated comorbidities across the MENA region.

• The relationship between vitiligo and comorbid conditions has not been fully explored in the context of the MENA population .
Vitiligo not only showed a significant psychological and clinical burden on patients but also has a high economic burden, influencing the need for a comprehensive management approach. [1-3]

## METHOD

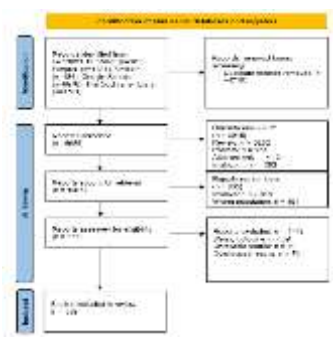
• A comprehensive PRISMA (Preferred Reporting Items for Systematic reviews and Meta-Analyses) search of databases (Google Scholar, Medline, PubMed, Scopus, Cochrane Library) from January 2014 to August 2024 included studies on vitiligo epidemiology, HRQoL, burden, and comorbidities. [4]
• Pooled prevalence was conducted using R software 4.2.2. with 95% confidence intervals (CI) and a significance level of p = 0.05.
• Heterogeneity was assessed using the Cochrane Q p-value and $I^2$ statistic, with values <50% indicating low heterogeneity.
• Newcastle-Ottawa Scale and Cochrane risk of bias assessment tools were used for quality evaluation. [5-7]

## RESULTS

### Study selection and inclusion process

A total of 88 studies were included in this systematic review and meta-analysis, after removing 4,718 duplicates, 5,853, and 114 were deemed irrelevant and excluded – **Figure 1.**

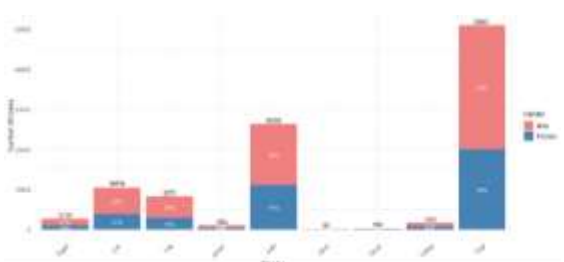
**Figure 1: PRISMA Flow Diagram for Screening and Inclusion Process**



### Vitiligo cases distribution based on country and gender

The Kingdom of Saudi Arabia (n=26,269) had the highest vitiligo cases compared to other countries, followed by Iran (n=10,550) then Iraq (n=8,278) Male gender was predominantly among the vitiligo cases in all countries – **Figure 2**.

**Figure 2: Vitiligo Cases by Country and Gender**



### The prevalence of comorbidities and clinical types among vitiligo cases

The left panel illustrates the prevalence (%) of various comorbidities. Each bar represents the pooled prevalence with 95% CI indicated by error bars. The right panel shows the prevalence of different vitiligo types with 95% CI.
Generalized vitiligo is the most common type, with a prevalence of 57.75%, followed by vulgaris at 45%.
Comorbidities are prevalent, with depression affecting 54.03%, diabetes at 9.14%, thyroid disorders at 12.32%, hypertension at 23.56%, renal disease at 10.59%, and Quality of Life Impairment yielded a SMD of 13.12 (95% CI: 12.94 to 13.29) - **Figure 3-4.**

**Figure 3: Prevalence Among Vitiligo Patients in MENA Region**

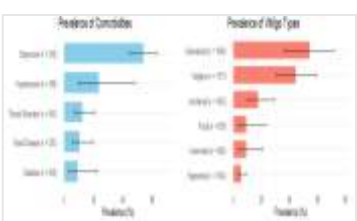
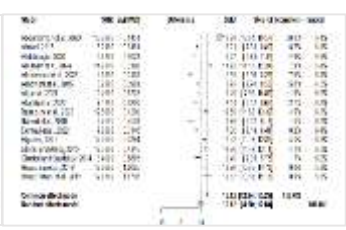


**Figure 4: Quality of life assessment in vitiligo patients**



### Publication bias

The Dot plots illustrating the distribution of p-values from studies investigating comorbidities (left) and vitiligo types (right) in relation to potential publication bias
Each point represents a study topic, and the horizontal dashed red line indicates the conventional threshold for statistical significance (p = 0.05) – **Figure 5 & Table 1.**

**Figure 5: Dot Plot of P-Values for Vitiligo-Related Studies (Publication Bias)**

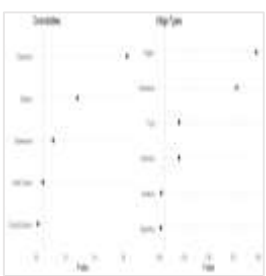


**Table 1: Bias and Heterogeneity Estimates in Vitiligo Outcomes**

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