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# Literature Review for Prediction of Alzheimer's Disease using Mendeley and Google NotebookLM

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## ABSTRACT

The disease of Alzheimer is a progressive neurological disease. In its early stages, Alzheimer's disease (AD) is hard to predict. A proper treatment given at an early stage of AD is more effective, and it causes minor damage than a treatment done at a later stage. Several machine learning techniques have been employed to identify the best parameters for Alzheimer's disease prediction. Literature review is one of the important steps towards conducting any research. It is essential to use references for writing a research article, a review article, or a book chapter. For every kind of article or book, one has to use citations of previous related studies. There are many tools to use manage their references. Mendeley, EndNote and Zotero are the most popular reference management tools used by many researchers. We use Mendeley for literature review for prediction of Alzheimer's as Mendeley is a free reference management software that can be used for both desktop and web applications. We also use Google Artificial Intelligence tool NotebookLM for checking relevancy of the articles and relevant articles include in the study.

## INTRODUCTION

The syndrome of dementia is loss of memory, deterioration of thinking ability and behaviour and inability to perform everyday activities. Dementia affects older people but ageing is not a normal part of dementia (Ray *et al.,* 2007). The disease of Alzheimer is a progressive neurological disease. Dementia is the most important and primary concern for Alzheimer's disease - there is deterioration in memory, thinking, behaviour and the ability to perform everyday activities (Lim *et al.,* 2022). In the early stage of memory loss is the result of Mild cognitive impairment (MCI) and it also jeopardise the individual ability of performing his/her independently daily living activities. So in later stage MCI patients may develop to Alzheimer disease (AD). In its early stages, Alzheimer's disease is hard to predict. A proper treatment given at an early stage of AD is more effective, and it causes minor damage than a treatment done at a later stage (Kavitha *et al.,* 2022). Several machine learning techniques have been employed to identify the best parameters for Alzheimer's disease prediction in Agarwal *et al.* (2015), Beheshti *et al.* (2019), Singh and Mishra (2023), Krishna *et al.* (2018), HR *et al.* (2022), Ghanty (2023).

Literature review is one of the important steps towards conducting any research. It is essential to use references for writing a research article or review article or a book chapter. For every kind of articles or books one has to use citation of previous related studies. There are many tools are available in market to manage references. Some of them are freely available and for few of them need to pay (Zhang, 2012). The examples of freely available reference management tools are Mendeley, JabRef and Zotero etc. Few examples of paid reference management tools are EndNote, BookEnds and Citavi etc. Among free versions Mendeley and Zotero are most popular reference management tools used by many researchers (Dawson, 2020). We use Mendeley for literature review for prediction of Alzheimer's as Mendeley (Tattersall, 2011; Takatori, 2016; Haunschild, 2020; Foekcler *et al.,* 2022) is a free reference management software that can be used for both desktop and web applications. For web version of Mendeley provide online storage free up to 2 GB whereas Zotero provide online storage free up to 300 MB only (Zhang, 2012). We also use Google Artificial Intelligence (AI) tool NotebookLM (Martin and Johnson, 2023) to summarize the contents in text and audio format and finally add the relevant articles in this study.

## MATERIALS AND METHODS

We have used Mendeley desktop and web applications for literature review of Alzheimer's prediction. Several features of Mendeley have been used for this study. First we download Mendeley version 2.132.1 for desktop application. Then signup with personal details in Mendeley web version. After that we can use both the applications with same login id and password. The methods (features) have been used for this study as below.

a) Add references in desktop application from previously saved files from local drives.

b) Search with keywords in Mendeley web application and add to our Mendeley library.

c) Add references manually in both the application – Create references without PDFs.

d) Explore related articles and add relevant articles to

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the library.

e) Check for incomplete references and verify the same from Google and from the source of the article. If still not find the complete information of the article then remove those from our Mendeley library.

f) Check the relevancy of the articles from the library and remove irrelevant references from the library by using Google AI tool NotebookLM.

g) Add tags to the articles in the library for easy search in future.

h) Explore the feature of Change Citation Style.

i) Use Formatted Citation to list the references in this study.

j) Explore the feature of Mendeley Cite for Microsoft Word.

## RESULTS AND DISCUSSION

In this study our focus is only to literature review for Alzheimer's prediction using Mendeley reference management software. First we upload 5 relevant journal articles of Alzheimer's prediction saved in local drives using Mendeley desktop application using Add References->Inport file(s) option. After search in Mendeley web application with Keyword "Alzheimer's Prediction", add most relevant article in our Mendeley library. This operation is shown in Figure 1. Then we search for related articles from above search result and add relevant articles in our library shown in Figure 2. Figure 3 depicts the Mendeley library after addition of above three operations. In Figure 3 we check that one reference has incomplete information (without Authors name). For this incomplete reference we check with Google and found a article (Figure 4) with same title but not matched with other information like source, volume and number etc. We extract the source of the article in our library and verify from the source. We did't find any such article in given volume and number (Figure 5). So we decide to remove the reference from our library using the Move to Trash option. This operation is shown in Figure 6.

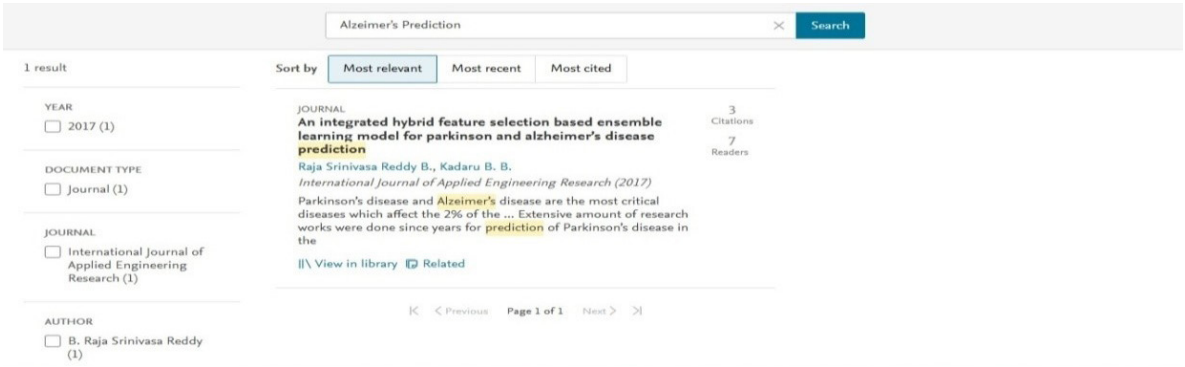


**Figure 1:** Search with Keywords in Mendeley Web Application

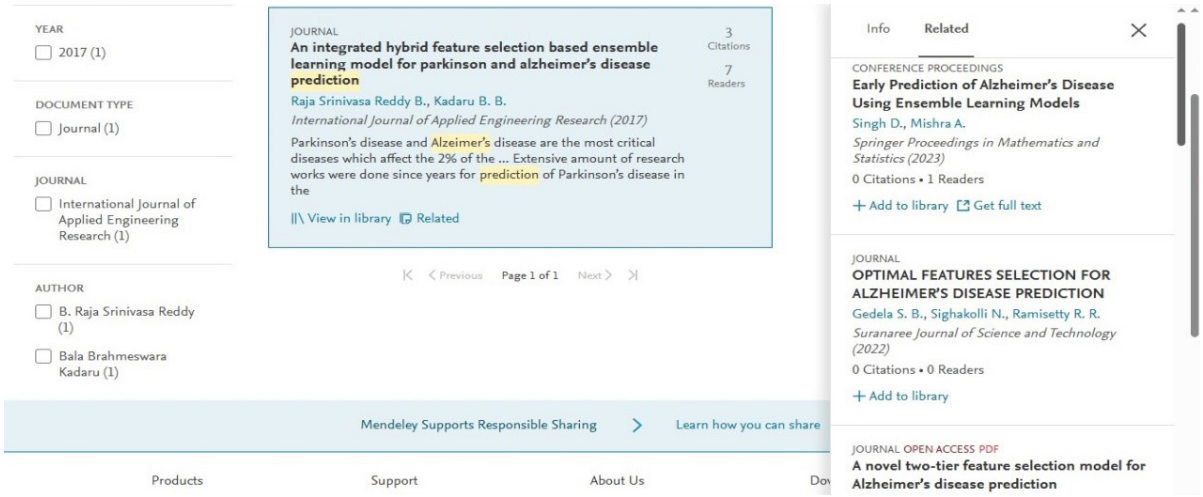


**Figure 2:** Explore the related articles of searched results of Figure 1

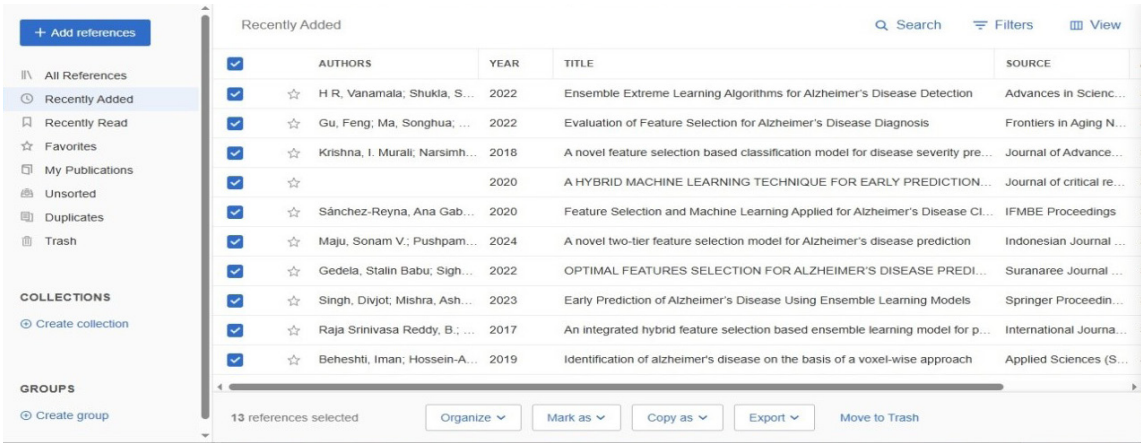


**Figure 3:** List of references in Mendeley Library after different add reference options

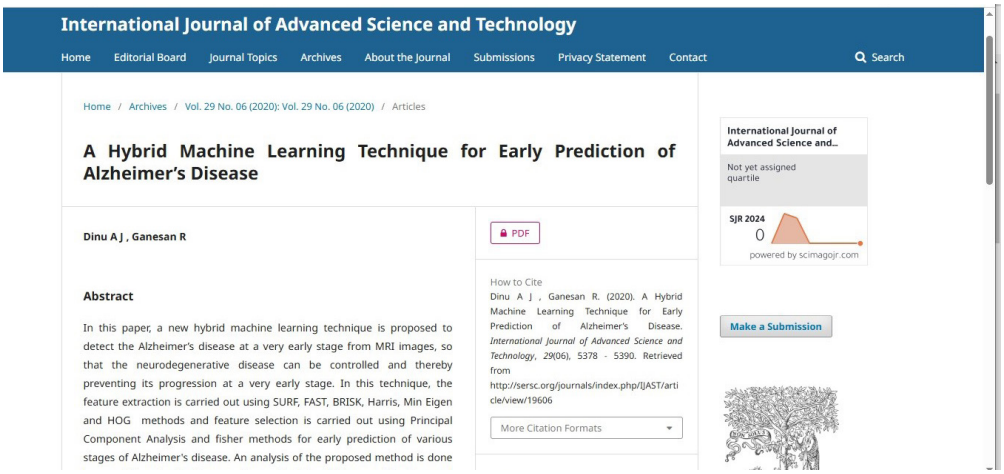


**Figure 4:** Google search result of the incomplete reference in our library

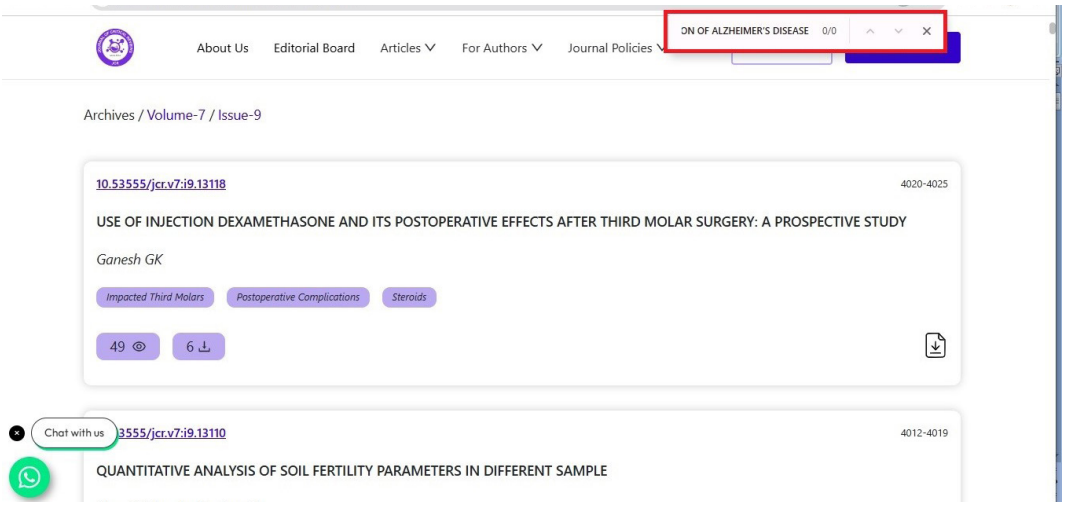


**Figure 5:** Search result from the source of the incomplete reference

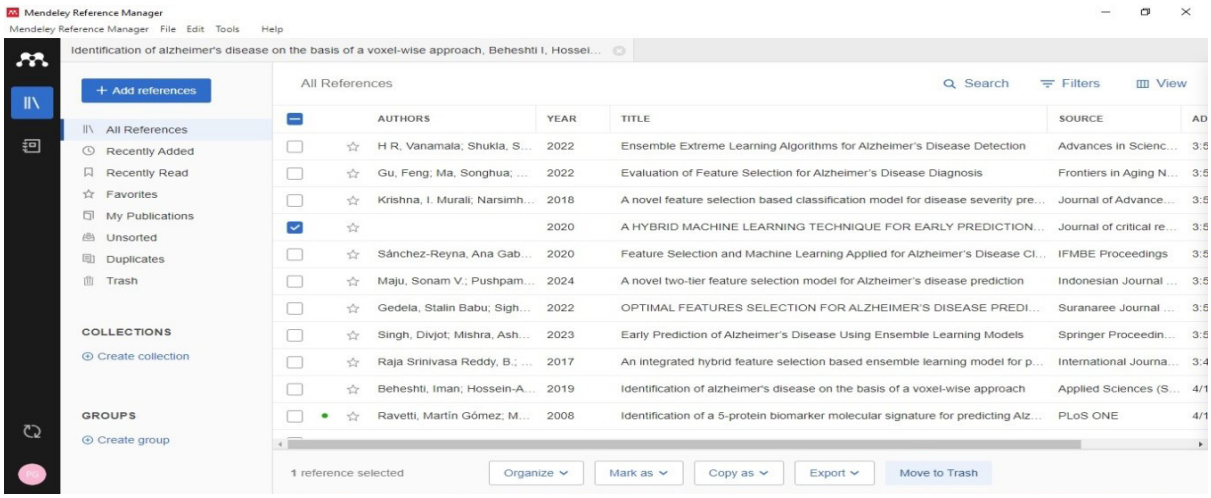


**Figure 6:** Delete of incomplete reference from our library

Now we use Google AI tool NotebookLM to summarize the content of the articles from our Mendeley library. We upload one article file at a time and take the summary in text as well as in audio format. In Figure 7, after adding one file in our "Alzheimer Prediction Notebook" is shown. Figure 7. The summary of the uploaded article can be generated by using few predefined questionnaires or question can be created here. After selecting a predefined question the summary of one uploaded article is shown in Figure 8. The "Briefing doc" feature also explore with the same artcicle and shown in Figure 9. We add another file and take the summary in text and audio format shown in Figure 10.

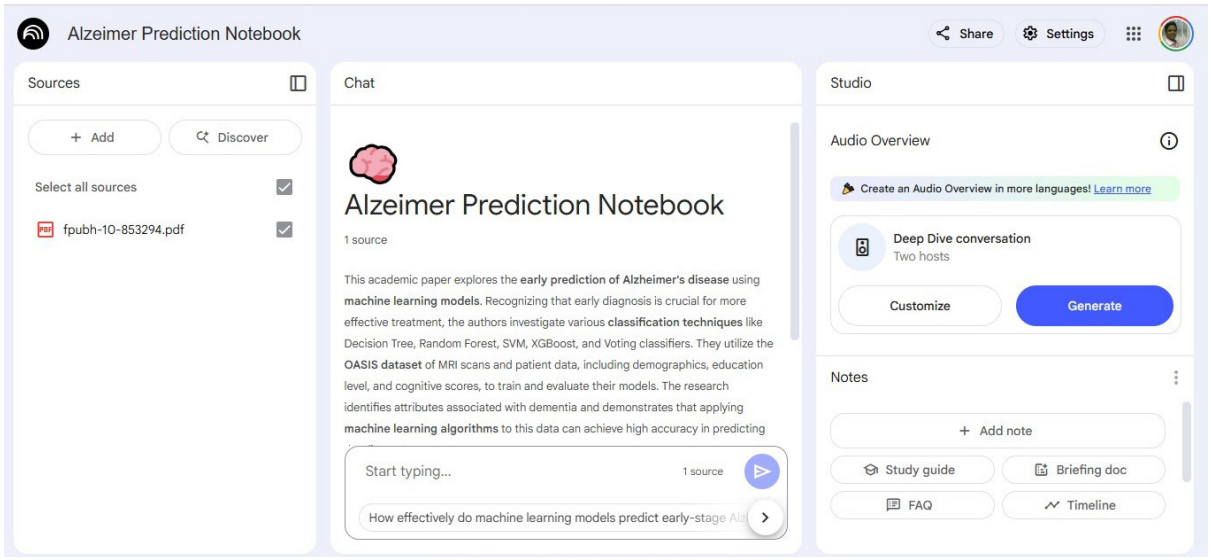


**Figure 7:** After adding one file in our Notebook in Google NotebookLM

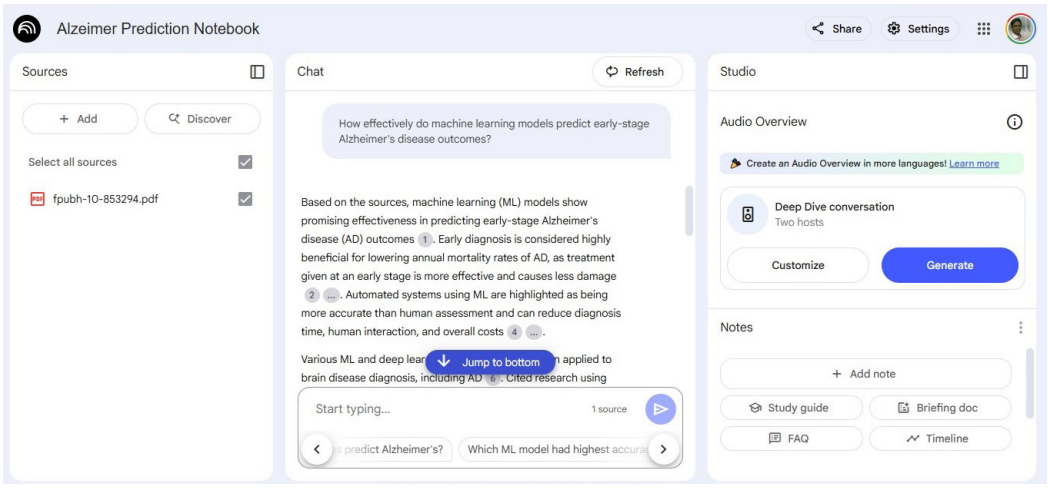


**Figure 8:** Summary of one article with predefined question in NotebookLM

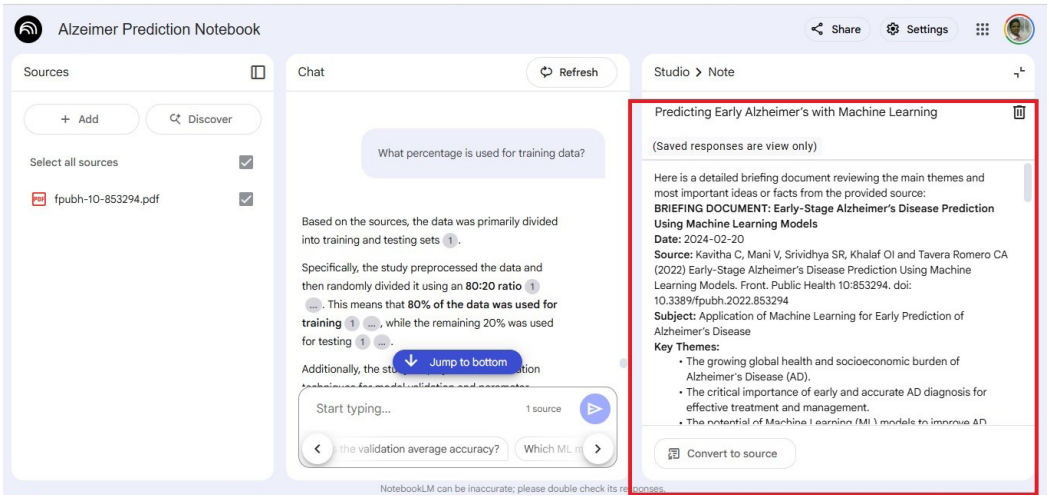


**Figure 9:** Summary of one article with Briefing doc in NotebookLM

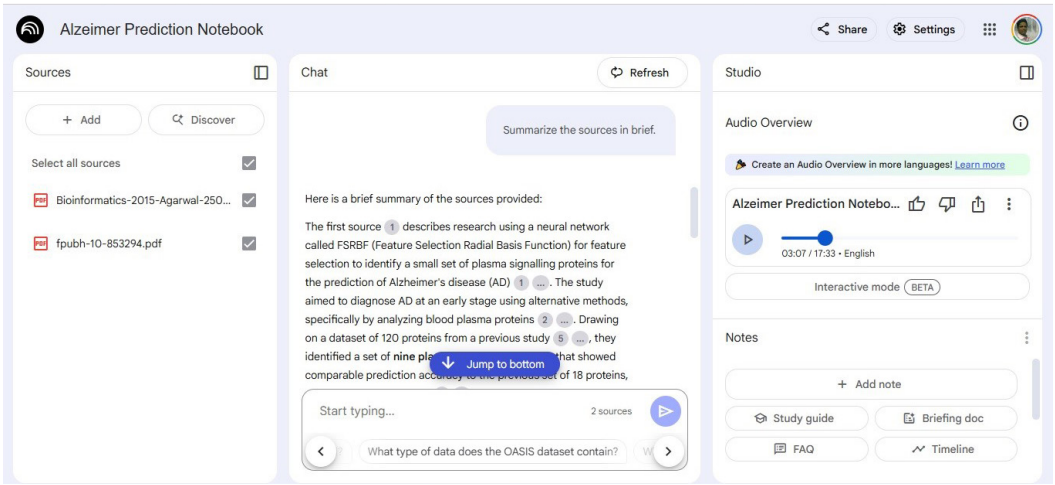


**Figure 10:** Summary of two articles in text and audio format

Now we explore the Discover Sources feature with our focused problem of Alzheimer prediction in NotebookLM. The results of the operation is shown in Figure 11. The summarized of the all sources in text and in audio format is shown in Figure 12 with the key "Summarized the sources in brief". We also explore the feature of Mind Map and the result is shown in Figure 13 with some node expanded. We go through the summarized texts and listen audio clips generated by NotebookLM to decide the relevancy of the articles explore through Mendeley and NotebookLM.

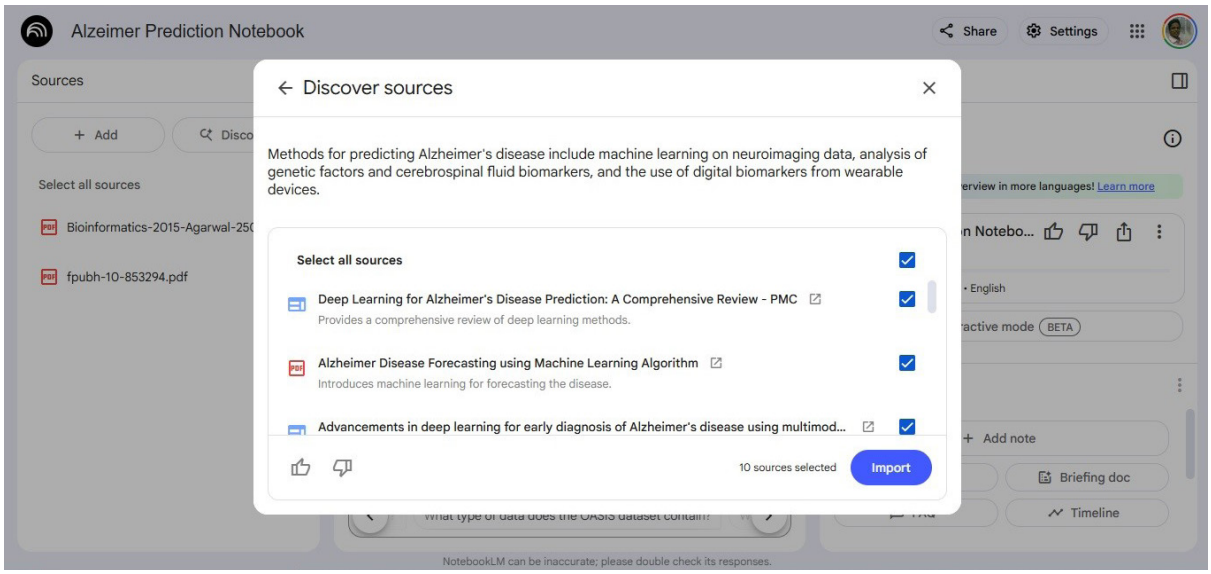


**Figure 11:** Discover Sources in NotebookLM

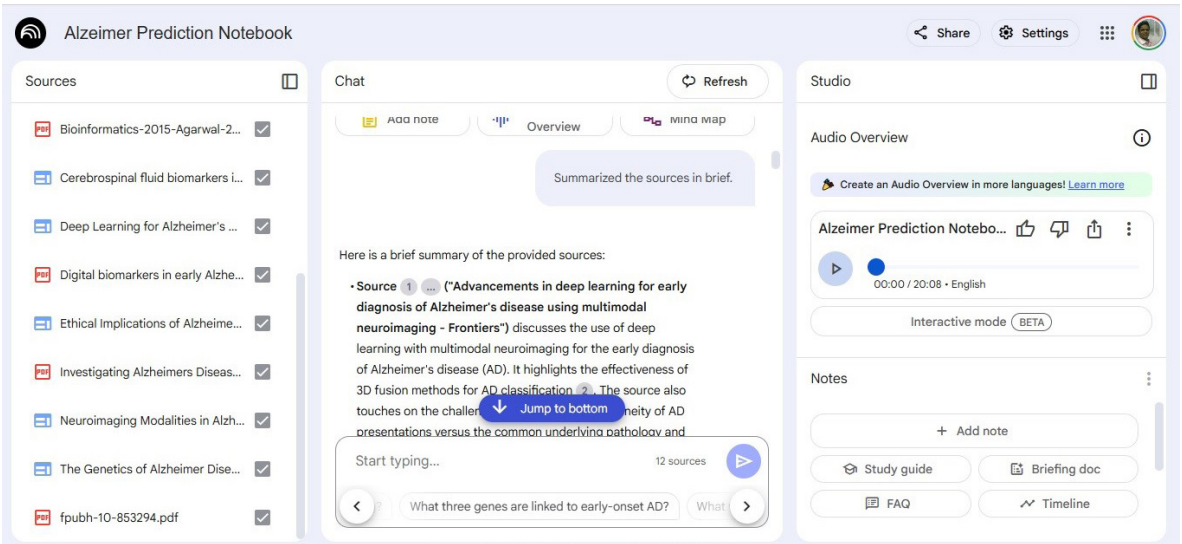


**Figure 12:** Summary of multiple articles in text and in audio format

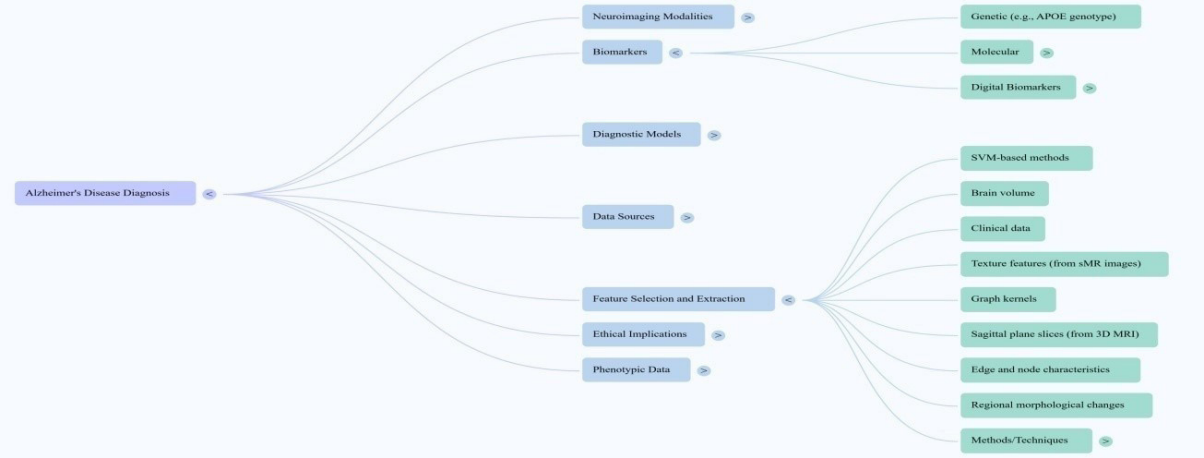


**Figure 13:** Mind Map with NotebookLM

We also explore the feature of add reference in the library manually i.e. create references without PDFs. This operation is shown in Figure 14. This is an important feature when we are unable to upload file for article from local drives as well as not available in Mendeley web application search (may not Scopus indexed article) but relevant to our study obtained in NotebookLM Discover Sources feature.

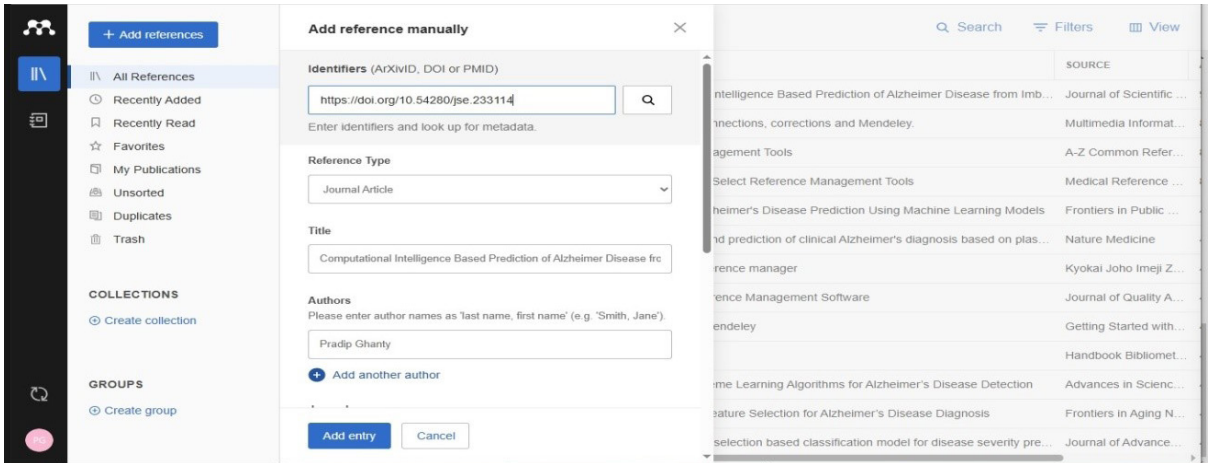


**Figure 14:** Adding references in the library manually

Adding tags is an important feature of Mendeley to reference article in the library for better organization and future use. The adding tags operation is shown in Figure 15. Different journals or conference proceedings or books require different citation style. So we explore the feature change of citation style as shown in Figure 16. We choose APA 7th Edition citation style for our study.

Now we search references for reference management software and add relevant references in our library. We also explore the feature of Mendeley Cite for Microsoft Word. Finally we add the relevant references in the current article at end (References section) using the feature of Copy of Formatted citation and paste in word file. This operation is shown in Figure 17.

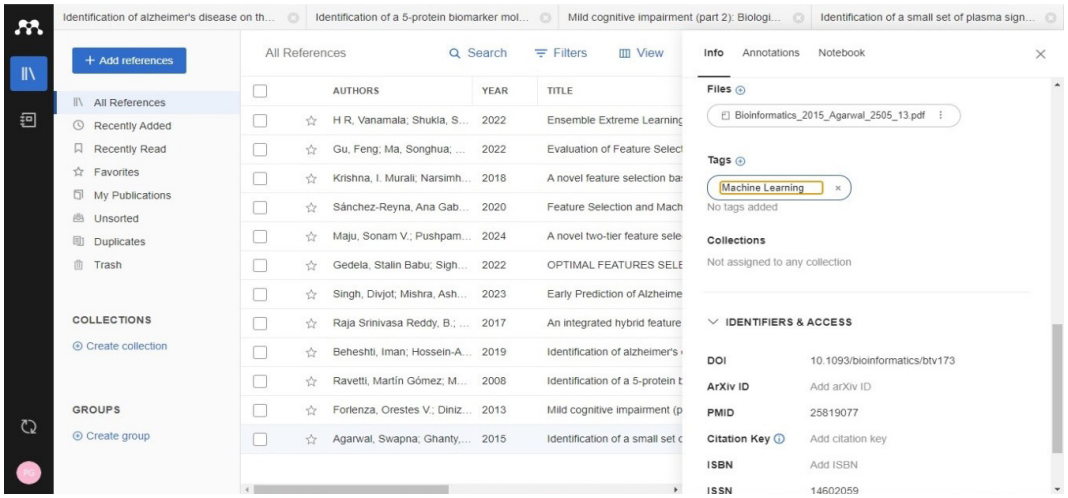


**Figure 15:** Adding tags of an article in our Mendeley library

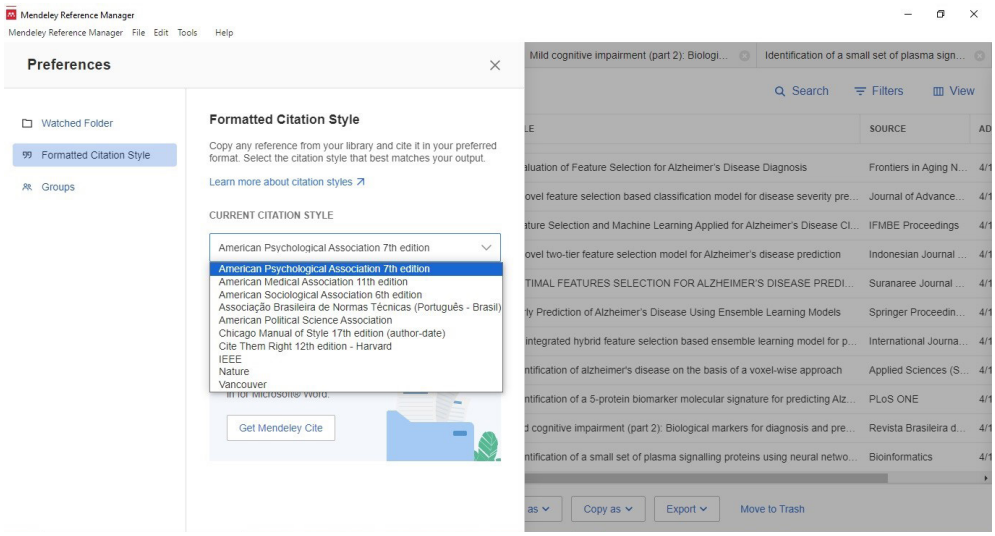


**Figure 16:** Change of Citation Styley

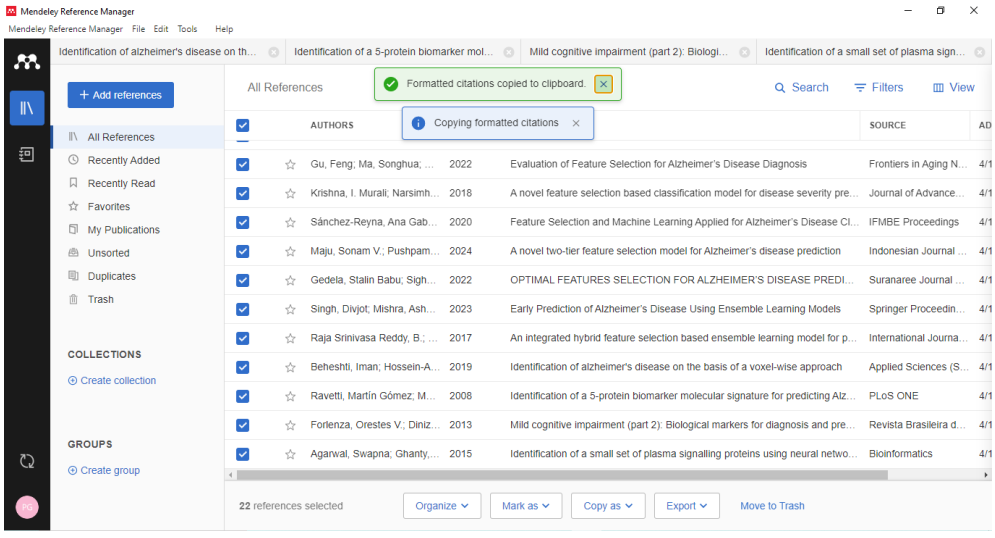


**Figure 17:** Copy of Formatted Citation

## CONCLUSION

In this article we explore the different features of Mendeley reference management software to conduct the literature review of Alzheimer's prediction. We have used both desktop and web application of Mendeley. We also explore the different features of Google AI tool NotebookLM to find the relevancy of the articles for our studied problem. There are many features of Mendeley left to explore for future. Other reference management tool can be used for further citation analysis. Bibliometric Analysis (Skhiri, 2024) also left for future study. This research can be extended for other problems also.

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