Mobile Health Application Rating Tool

Sathyasri.B¹, Mahalakshmi.V², Janani.P³,Kanmani Ruby E.D⁴, Kanmanipappa.C⁵

¹Vel Tech RangarajanDr.Sagunthala R&D Institute of Science and Technology. dr.sathyasrib@gmail.com,

²Vel Tech RangarajanDr.Sagunthala R&D Institute of Science and Technology. maha.88.ece@gmail.com

³Vel Tech RangarajanDr.Sagunthala R&D Institute of Science and Technology. jananiscorptech@gmail.com

⁴Vel Tech RangarajanDr.Sagunthala R&D Institute of Science and Technology. bewinbewin54@gmail.com,

⁵Vel Tech RangarajanDr.Sagunthala R&D Institute of Science and Technology. kanmanipappac@veltech.edu.in

Abstract

Portable wellbeing ("applications") has quickly multiplied, yet their capacity to improve results for patients stays indistinct. An approved apparatus that tends to applications conceivably significant measurements has not been accessible to patients and clinicians. This venture was to create and start probing a usable, legitimate and open source evaluation apparatus to impartially assess the dangers and benefits of wellness applications. Regardless of this expansion, barely any wellbeing applications have been appeared to accomplish what is seemingly their most significant objective: to improve tolerant results. Numerous applications have all the earmarks of being centered on moderately sound patients, with numerous less being centered on significant expense, high-need patients, or patients with ongoing infections. All things considered, most applications are utilized for brief timeframes and afterward dropped. This is hazardous particularly for patients with constant illnesses who may profit by a more drawn out term insight. We realize that far reaching longitudinal consideration bears the cost of patient's better results, yet a longitudinal relationship with an application isn't the standard. For example, when present, there is a significant reduction in hemoglobin A1c in type 1 diabetes. Although short-term use may be beneficial, for example, for patients passing and colonoscopy that have colonic prep in the direction of the application, we have not put the disease in a weak state given its large community size and open space for development.

Key Words: mobile applications, eHealth, rheumatology, mHealth, Mobile App Rating Scale.

1. **Introduction**

Portable wellbeing applications have multiplied more quickly than practically some other advancement in medical services: Over 300,000 wellbeing applications are accessible today, speaking to a multiplying since. An expected 40% of all applications are identified with wellbeing. This has been made conceivable by the fast selection of application empowered cell phones. Public studies proposed that the greater part of cell phone clients have downloaded a wellbeing application, despite the fact that this doesn't indicate use. Notwithstanding this multiplication, hardly any wellbeing applications have been appeared to accomplish what is

seemingly their most significant objective: To improve quiet results. Numerous applications have all the earmarks of being centered on generally sound patients, with numerous less being centered on significant expense, high-need patients, or patients with ongoing illnesses. All things considered, most applications are utilized for brief timeframes and afterward dropped. This is dangerous particularly for patients with ongoing infections who may profit by a more drawn out term insight. We realize that thorough longitudinal consideration bears the cost of patient's better results, yet a longitudinal relationship with an application isn't the standard. For example, when it occurs, there is a significant reduction in hemoglobin A1C in type 1 diabetes. Real problem with the direction of the application. Our ever-increasing disease has given its greatest weight to society and an open way for development. In spite of their expected advantages, applications likewise convey hazards. Some applications have even caused hurt, regardless of whether by misdiagnosis of skin malignant growth or inaccurate revealing of circulatory strain. Of course, even non-destructive individuals may have careless guidelines in terms of safety, social interaction, and good content that can cause harm during this time agreed by customers. Indeed, even those that are not straightforwardly destructive may have careless guidelines with respect to security, interoperability, and wellbeing content that could cause hurt not at this point acknowledged by the client. Numerous application clients are left with minimal in excess of an application's star rating to choose whether an application might be ideal for them. Hardly any distributed investigations assess unintended antagonistic occasions brought about by application use. A scoring instrument that seeks to distinguish apps that are likely to cause harm could improve app security and reduce future adverse opportunities. We guessed that different explicit metrics can be recognized around which apps can be represented to describe their quality, their well-being and an expected incentive. If so, a standardized and usable scoring device could help buyers and clinicians make informed choices about the use of apps. It could likewise control application designers, controllers, and policymakers. Various endeavors have been made to do this for applications, yet they have been frustrated by helpless ease of use and a deficient proof base, among different issues. With the correct mix of ease of use, legitimacy, security, and protection, we accept wellbeing applications can be valuable, and even conceivably groundbreaking for wellbeing and medical care. Nonetheless, devices to address these and different measurements are not broadly utilized, and routine evaluations tending to these measurements are not accessible bringing about an absence of data to settle on educated choices on which applications to utilize or suggest. As a stage toward tending to this issue, we created and for starters evaluated a rating device to unbiased survey the dangers and advantages of wellbeing applications. We present the apparatus improvement measure, device qualities, and starter evaluations created utilizing the device with a few hundred of the present wellbeing applications, some exceptionally appraised by traditional star rating frameworks, just as lowerappraised applications, to check whether we could recognize contrasts.

2. Literature Survey

2.1 Thesis Health Application Rating Tool

Now-a-days use of applications is going high. Furthermore, even individuals are utilizing wellbeing applications too. More than 300,000 wellbeing applications are accessible today. From 2015 the utilization of wellbeing applications are increment by 27 percent. This shows individuals are embracing wellbeing applications. These applications are having more advantages. Alongside that they are having more dangers moreover. Individuals are choosing the

security, quality, advantages of the applications by their rating. [2] Approved applications that look to differentiate between potentially harmful applications can improve the security of the app and reduce future friendliness. The patients and clinicians should know which application is positive or negative by a rating apparatus. By the blend of convenience, accessibility, and security they accepted wellbeing applications can be advantageous and even helpful for wellbeing and medical services. For the cycle of application rating the accompanying spaces are there straightforwardness, wellbeing and specialized substance, security and protection, ease of use, emotional. For the wellbeing application applications for portable they built up an application rating instrument called as THESIS, by utilizing this application apparatus they are appraising the versatile wellbeing applications with more prominent than or equivalent to 4 star and under 4 star. They had evaluated 211 apps. [3] This rating device recommends applications that serve patients with constant infection. THESIS primer testing suggests that applications are inadequate, especially for protection / safety and between functionality, and few seem to be expected for patients with persistent conditions. [4] THESIS warrants further testing and can further improve programming and policy maker's application execution. Strategies for handling this venture are apparatus improvement, next is application determination in this we need to incorporate arrangement of applications with lower and higher star ratings.[5] To guarantee assorted arrangement of applications we have partitioned into three classes (Category 1) exceptionally evaluated, (Category 2) 4 appraised or multiple stars and (Category 3)less than 4 appraised. For every one of these arrangements of applications fundamentally centered around constant sicknesses. From every one of these sets some applications must be chosen from various classifications. And all chose applications won't be appraised because of asset imperatives. [6] Next strategy will be application rating: In this all the qualified applications which must be evaluated are appraised dependent on the distinctive area scores by consolidating the mean of the measure.

(Alluded FROM:Journalname:Design and testing of versatile wellbeing rating tool;Author:DavidM.Levine) .

2.2 Mars Mobile Health Application Ratingtool

There is an extraordinary potential in utilizing eHealth apparatuses, particularly in constant rheumatic diseases [7]. The truth of Rheumatology is by all accounts just an issue of time. Versatile applications and other eHealth instruments could encourage the lives, all things considered, including patients, doctors, medical coverage organizations and the drug industry [8]. The utilization of symptomatic choice emotionally supportive networks could abbreviate an opportunity to address finding, in any event, for uncommon infections. When a right analysis is set up, patients and doctors need to keep up infectious prevention, which requires constant checking of treatment adherence, exact manifestation following, and reconnaissance of antagonistic treatment impacts. E-Health is promising to build the amount, quality and accessibility of clinical information, consequently permitting a more exact and customized treatment [9,10] Which a precise clinical evaluation is cultivated utilizing an E-Health device without requiring an immediate patient-doctor encounter.[11] Such devices could radically expand the proficiency of medical care conveyance. Limitations to be highlighted in application stores. [12] These low market obstructions draw in different organizations that try to take advantage of the lucky break of entering the productive medical care market. This prompts a significant heterogeneity concerning security and quality when all is said in done. Quality

pointers for medical services related applications past the application store star appraisals, remarks and number of downloads, are to a great extent unavailable.[13] Application trust marks and CE names are rarely found. The validated Mobile Application Rating Scale (MARS) is among the devices that are not very popular for assessing application quality. [14] Since its dissemination in 2015, it has been used to evaluate various clinically versatile applications. The MARS score depends on a 5-point Likert scale in four segments with numerous

things: engagement (5 things), usefulness (4 things), style (3) things) and data quality (7 things). There is also an "emotional" segment, which consists of 4 elements. [15] A New Zealand concentrate recently detailed the ramifications of a MARS assessment to assess tolerant uses in rheumatoid joint pain and found that there are no top-notch uses. Such precise quality assessments are sparse and indicate a neglected need. A new overview, led by the work The Young Rheumatology Group of the Young Rheumatology Working Group (Rheumadocs) has shown that the use of clinical applications by German rheumatologists has increased by 12 years within two years, while rheumatologists only have two recommended applications for the Knowing about rheumatology (RheumaHelper, RheumaLive). [16] For everyone, an efficient quality assessment of rheumatoid science applications that are available in German application stores has not yet been completed. The aim of this study was therefore to identify and evaluate rheumatology-explicit German versatile applications that focus on patients and doctors.

(Alluded from: Who utilizes cell phone wellbeing applications and utilizations matter. A auxiliary information insightful approach; Author: Jennifer K carrolletal. J Med Interest Res).

3. Methods

3.1 Block Diagram:

The principal phase of this undertaking is to choose applications after that we need to separate them on standards to score application. Also, at the last stage we need to rate the applications dependent on various areas.

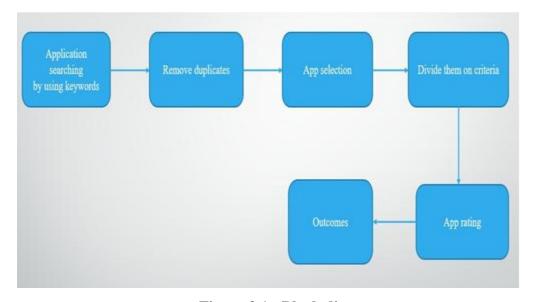


Figure 3.1: Block diagram

3.2 App Selection

Our goal was to incorporate an assorted arrangement of applications with higher and lower star ratings, sensing that app store ratings will likely not reflect true quality. To ensure an assorted arrangement of applications, we had three rating ratings of default applications, all of which focus on constant disease applications. We included exceptionally rated apps in our previous survey, apps rated at least 4 stars, and apps rated below 4 stars. For each of the three ratings, we avoided apps that weren't in English, they were picked up from the app store during the inquiry, were basically selling an item other than the app, had negligible utility, needed updates, required an external gadget or connection, required a relationship with a wellness picture account, or were not in wellness and wellness areas or clinics. Applications accessible for both Apple and Android were checked on just on the stage that they were first delivered. The applications in the ratings all had huge amounts of star ratings to avoid minor deviations from the normal application score. Have applications been reviewed on previous work that, across various philosophies, were known to work well for ongoing illnesses and patients with significant expense for high demands? For the ongoing infection rated 4 or more stars in their separate application archive. We reviewed both application repositories with the constant disease name (eg, "hypertension") and chose the four most deeply evaluated applications for each persistent infection. In case an underlying hunt did not produce adequate applications, we rather looked for a pre-specified reflex term (eg rather than "hypertension" we looked at "circulatory strain"). On the off chance that an underlying fighter produced applications that weren't relevant, we added the search term with pre-specified modifiers (for example, "impulse director"). We look for high blood pressure, heart disease, coronary heart disease, stroke, heart arrhythmia, hyperlipidemia, stroke, rheumatoid arthritis, asthma, increased growth, progressive kidney disease, heart disease Prevents disease, stubbornness, psychosis, depression, diabetes, hepatitis, osteoporosis, schizophrenia, confusion, substance abuse problems, and depression. We endeavored to rate the four most exceptionally appraised applications in every sickness gathering, however on the off chance that there were deficient applications, With immediate effect we have rated additional applications in infection groups with 4 ratings (additional method 2 for point-by-point search criteria). Categories 3 were applications for constant diseases that were rated fewer than 4 stars in their respective application store. We also looked through both application stores with the name of the constant infection and given reflex terms.

For the application rating we have looked n=63 applications from google play store by utilizing watchwords of eHealth applications. From those 63 applications complete n=47 applications are rejected which are not accessible in English, no longer for download, with containing adds, trick applications and so forth The n=16 applications are incorporated for the further cycle of wellbeing application rating device. The selected with their targeted diseases is shown in following figure 3.2.

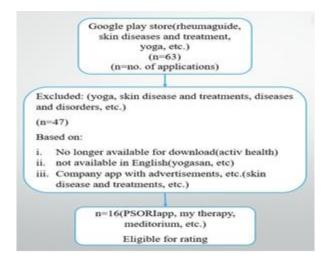


Figure 3.2: Mobile health application selection by using keywords

Apps	Target	Target disease				
Meditorium	Physician	Non-specific				
Rheuma - Auszeit	Patients	Rheumatoid arthritis				
RheumaGuide	Physician	Rheumatoid arthritis, ankylosing spondylitis				
ASAS App	Physician	Ankylosing spondylitis				
RheumaLive	Patient	Rheumatoid arthritis				
Pain Companion	Patient	Non-specific				
MyTherapy	Patient	Non-specific				
Psoriapp	Patient	Psoriatic arthritis				
Rheumatologie visuell	Physician	Rheumatic				
PsALive	Patient	Psoriatic arthritis				
AxSpaLive	Patient	Ankylosing spondylitis				
Lupuslog	Patient	Systemic lupus erythematosus				
Rheuma Edu	Physician	Rheumatic				
ANCAAssoziierte	Physician	Antineutrophil cytoplasmic				
Vaskulitiden		antibody associated Vasculitis				
RheumaBuddy	Patient	Rheumatoid arthritis, juvenile idiopathic arthritis				
Rheumatologie app	Physician	Rheumatoid arthritis, vasculitis				

Figure 3.3: Mobile health application selection

3.3 Mobile Health Application Domain And Criteria

After the application selection we have to score the included (n=16) application based on some criteria and domains. We have taken six domains for scoring application. They are 1) transparency 2) usability 3) design 4) engagement 5) content and 6) therapeutic alliance. In the area of transparency we have to check the prices of the application, the results and the process of access to the exchange of information and knowledge at the patient level. For the usability domain we have to check is the application is ease of use, how many members are using the application and satisfaction of the users about application. For a structured department, we will review a simple checklist - for example someone who logs their medical records every day or a few hours in the same way for a doctor who makes daily use and update any patients' health care. For all these updating and changes the application has ease of use. And we have to check privacy and security, privacy policy agreement-in this the testing of health application and how it

is working. For engagement domain we have check the relationship between patients and the application usage of the applications regularly. For content domain we have tocheck whether the application is related to health domain, the information regarding patient need. For therapeutic alliance or the working alliance we have to check the relation between health care professional and a client. These are the domains and their criteria for the mobile health application rating tool By considering each domain of all 16 applications content is higher, that means the content of all 16 applications is well defined. And design, transparency, usability should be further improved in these 16 applications. Conclusion of Fig 3.4: By considering each domain of all 16 applications content is higher, that means the content of all 16 applications is well defined. And design, transparency, usability should be further improved in these 16 applications.



Figure 3.4: Percentage of applications based on domain and criteria

3.4 App Rating

We had three assessments that were clinical, pre-medical and business related. Every room had models. Each standard was rated on a 5-point scale by the two rating areas. In order to combine the two individual evaluations, we determined the mean value for each base. We determined the all-encompassing room evaluation by registering the mean value of the evaluations of the connected models. At this point we determined the applications that were generally rated by processing the mean of the overall room ratings. We created a standardization tool to ensure that the evaluators rate the applications. The standardization tool did not know exactly how to rate an application appropriately and gave the assessor a chance to think about the correct score and why the score was not in every classification of the Instrument was one or one lower. We kept track of how long each assessment was required.

The underneath pie outline shows the level of utilizations dependent on rating.

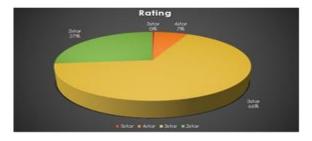


Figure 3.5: Percentage of applications based on rating

4. Simulation Results

4.3 DOMAINSCORES

Rubrics for domains given in the following table:

- Price: free = 10; Cost is less than 50 = 7-9; Cost is greater than 50 and less than 100 = 5-6; Cost is greater than 100 = 3-4;
- Results: excellent = 9-10; Very good = 7-8; Good = 6-7; Average = 4-5; Bad = 1-3;
- No. of users: more than 2 million = 9-10; 1 million to lea than 2 million = 7-8; More than 50 lakhs and less than 1 million = 5-6; More than 10 lakhs and less than 50 lakhs = 3-4; Less than these = 1-2;
- Satisfaction about app: excellent = 9-10; Very good = 7-8; Good = 6-7; Average = 4-5; Bad = 1-3;
- UI/UX: excellent user interface = 9-10; Good user interface = 7-8; Average user interface = 5-6; Belowayg user interface = 3-4; Bad user interface = 1-2;
- Policy agreement: no confidential information=8-10; Less confidential information=5-7; More confidential information = 2-4;.
- Medical field related: related to only medical =10; Related to medical and some other one = less than 9 to 5; not related to medical = less than 5;
- Medication: medical consultants with therapists and medication remainders = 8-10(based on reviews); consultants with therapists and few medications = 6-7; medication remainder with few consultancies = 4-5; not both = 1-3.
- Relation between health care professional and clients: excellent = 10; very good = 8-9; good = 6-7; average = 4-5; bad = 2-3;

Арр пате	Transperancy		Unability		Design		Engagement	Content		Therapeutic alliance	
	Proce	results	No.of Uters		UNIVE	motory agreem sent	Delly usage relation	Newhole friend referred	medican on	Mariation b/w health care professional and chents	
MyTherapy	10	4		5	7	7		10			
ASAS	10	4	7	5	6	5	7	10	6	7.5	
Paoriage	10		9	7			8.5	10			
Meditorium	3	5	5	5	6		6.5	10	4	7	
AxSPA free	10	6		۰	9	7		10	5	7	

Figure 4.1: Mobile health application ratings based on domains and criteria

4.4 APPLICATION RATING BASED ON REVIEW

APP NAME: MYTHERAPY

Scores given for each domain based on the following reviews:.

1. Transparency domain: Cost = free Results and clearance of medicines provided in application:

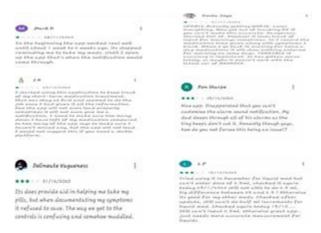


Figure 4.2: Reviews for transparency domain

Conclusion: For the transparency domain we have to check the cost in this the cost is free but the results which came from users is not that much good. So, we have given 7/10.

- 1. Usability domain: We have to check number of users and their satisfaction about that application. For the usability domain the usage of this application is more but the users of the application are having bad opinion on the application usage. Here satisfaction about the application is not good. So, we have less point to this domain by considering users reviews about usability.
- 2. Design domain: For this domain we have to check the ui/ux and privacy and security agreement. In this the ui/ux are average and not that effective. The privacy policy agreement also containing some confidential information access so we have given 7/10.
- 3. Engagement domain: For engagement domain we have to check the relationship between the patients and app in daily usage. So, for this their views of the daily users are good with mixed reviews. So, we have given 8/10 to this domain based on the different reviews.
- 4. Content domain: For the content domain we have to check the whether it is related to medical field and medications. In this domain it is completely related to medical field but in this app, we have to save our medications and it will remain us medications at fixed time that we are given. So, medications are not there so we have given 7/10 to this domain.
- 5. Domain of the therapeutic alliance: In this domain we have to verify the helping alliance or the working alliance Relationship between the health professional and a client. The therapist and the client expect to commit to each other for the benefit of the client therefore, in this

domain is only about drug remains. So, there is norelationship between the healthcare professional and a Client. But is dealing with medications which will be given by healthcare professionals owe have given 6/10 to this domain.



Figure 4.3: Reviews for domains

4.5 Simulation Outputs

```
Python 3.7.4 (tags/v3.7.4:e09359112e, Jul 8 2019, 19:29:22) [MSC v.1916 32 bit (Intel)] on win32 Type "help", "copyright", "credits" or "license" for more information.

>>> import m.py
enter the app name:Psa live
Psa live
overall application performance": 6.25
3 star
```

Figure 4.4: Overall rating of meditorium application

```
enter the app name:Rheumatologic visuell
Rheumatologic visuell
overall application performance": 6.91666666666667
3 star
```

Figure 4.5: Overall rating of rheumatologic visual application

```
Python 3.7.4 (tags/v3.7.4:e09359112e, Jul 8 2019, 19:29:22) [MSC v.1916 32 bit (Intel)] on win32 Type "help", "copyright", "credits" or "license" for more information.

>>> import m.py
enter the app name:Rheuma-Auszeit
Rheuma-Auszeit
overall application performance": 7.5
3 star
```

Figure 4.6: Overall rating of rheumaauszeit application

```
Python 3.7(32-bit)

Python 3.7.4 (tags/v3.7.4:e09359112e, Jul 8 2019, 19:29:22) [MSC v.1916 32 bit (Intel)] on win32

Type "help", "copyright", "credits" or "license" for more information.

>>> import m.py
enter the app name:Psa live

Psa live

overall application performance": 6.25

3 star
```

Figure 4.7: Overall rating of rheumatologie application

Figure 4.8: Overall rating of psA live application

```
Python 3.7.4 (tags/v3.7.4:e09359112e, Jul 8 2019, 19:29:22) [MSC v.1916 32 bit (Intel)] on win32
Type "help", "copyright", "credits" or "license" for more information.
>>> import m.py
enter the app name:Rheumatologie app
Rheumatologie app
overall application performance": 5.41666666666667
2 star
```

Figure: 4.9: Overall rating of rheumaguide application

```
Python 3.7.4 (tags/v3.7.4:e09359112e, Jul 8 2019, 19:29:22) [MSC v.1916 32 bit (Intel)] on win32
Type "help", "copyright", "credits" or "license" for more information.

>>> import m.py
enter the app name:Mytherapy
Mytherapy
overall application performance": 6.91666666666667

3 star
```

Figure 4.10: Overall rating of my therapy application

```
enter the app name:plain comparison
plain comparison
overall application performance": 7.66666666666667
3 star
```

Figure 4.11: Overall rating of plain comparison application

Figure 4.12: Overall rating of ASAS application

Figure 4.13: Overall rating of ax Spa live application

```
Python 3.7.4 (tags/v3.7.4:e09359112e, Jul 8 2019, 19:29:22) [MSC v.1916 32 bit (Intel)] on win32 Type "help", "copyright", "credits" or "license" for more information.

>>> import m.py
enter the app name:Psoriapp
Psoriapp
overall application performance": 8.68333333333334
4 star
```

Figure 4.14: Overall rating of psori application

```
enter the app name:lupuslog
lupuslog
overall application performance": 7.0
3 star
```

Figure 4.15: Overall rating of lupus log application

```
Python 3.7.4 (tags/v3.7.4:e89359112e, Jul 8 2019, 19:29:22) [MSC v.1916 32 bit (Intel)] on win32 Type "help", "copyright", "credits" or "license" for more information.

>>> import m.py
enter the app same:Rheumatlogic
Rheumatlogic
overall application performance": 6.6666666666667

3 star
```

Figure 4.16: Overall rating of rheumatology application

```
Python 3.7.4 (tags/v3.7.4:e09359112e, Jul 8 2019, 19:29:22) [MSC v.1916 32 bit (Intel)] on win32 
Type "help", "copyright", "credits" or "license" for more information.

>>> import m.py
enter the app name:Nhuema live
Nhuema live
overall application performance": 7.75
3 star
```

Figure 4.17: Overall rating of rheuma live application

```
Python 3.7.4 (tags/v3.7.4:e89359112e, Jul. 8 2019, 19:29:22) [MSC v.1916 32 bit (Intel)] on win32
Type "help", "copyright", "credits" or "license" for more information.

>>> import m.py
enter the app name:Mheuma bubby
Rheuma bubby
overall application performance": 5.91666666666667

2 star
```

Figure 4.18: Overall rating of rheuma buddy application

```
enter the app name:ancaasozilerate
ancaasozilerate
overall application performance": 6.75
3 star
```

Figure 4.19: Overall rating of ancasozilerate application

S.no	Application name	Transparency	Usability	Design	Engagement	Content	Therapeutic alliance	Rating
1.	Meditorium	4	5	5	6.5	7	7	2 star
2.	Rheuma - 8 Auszeit		9	7	6	8	7	3 star
3.	Rheumaguide	3	4	6	4	5	5.5	2 star
4.	ASAS	7	6	5.5	7	8	7.5	3 star
5.	Rhuema live	8	8	7	8	7.5	8	3 star
6.	Plain 8 companion		7	8	6.5	8.5	8	3 star
7.	MyTherapy	7	6.5	7	8	7	6	3 star
8.	Psoriapp 7		8	8	8.5	9	8	4 star
9.	Rheumatlogic	7	6.5	7	6.5	7	6	3 star
10.	PsA live	5	6	7.5	7	6	6	3 star
11.	Ax spa live	8	7	8	8	7.5	7	3 star
12.	Lupuslog	9	7	4	7	8	7	3 star
13.	ANCAA ssoziierte	6	7	6	8	7	6.5	3 star
14.	Rheuma buddy	5	6.5	6	6	7	6	2 star
15.	Rheumatologie 5 app		5	6	7	5	4.5	2 star
16.	Rheumatologic visuell	6	7	6	8	8	6.5	3 star

Figure 4.20: Overall rating of Health applications

5. Conclusion

The fundamental ends that can be drawn after the introduced examination are the following: Mobile wellbeing applications have quickly multiplied, yet their capacity to improve results for patients stays indistinct. An approved apparatus that tends to applications' conceivably significant measurements has not been accessible to patients and clinicians. This undertaking is to create and for starters evaluate a usable, substantial, and rating apparatus to equitably quantify the dangers and advantages of wellbeing applications. This task will give the report for the application dependent on the diverse domains. The future extent of this venture is to build up an open source rating instrument which will investigate the exhibition of the applications consequently by improving in coding and improving the wellbeing application rating device to give rating for oftentimes refreshed applications.

6. References

- [1] The Growing Value of Digital Health.https://www.iqvia.com/institute/reports/thegrowing-value- of-digital-health(2017).
- [2] Demographics of Mobile Device Ownership and Adoption in the United States. Pew Research Center. http://www.pewinternet.org/fact-sheet/mobile/(2018).
- [3] Krebs, P. Duncan, D. T. Health app use among US mobile phone owners: a national survey. JMIR mHealthuHealth. 3(4), e101(2015).
- [4] The Growing Value of Digital Health. https://www.iqvia.com/institute/reports/thegrowing-value- of-digital-health(2017).
- [5] Demographics of Mobile Device Ownership and Adoption in the United States. Pew Research Center. http://www.pewinternet.org/fact-sheet/mobile/(2018).
- [6] Krebs, P. Duncan, D. T. Health app use among US mobile phone owners: a national survey. JMIR mHealthuHealth. 3(4), e101(2015).
- [7] Carroll, J. K. et al. Who uses mobile phone health apps and does use matter? A secondary data analytics approach. J. Med. Internet Res. 19(4), e125(2017)
- [8] Schoeppe, S. et al. Efficacy of interventions that use apps to improve diet, physical activity and sedentary behaviour: a systematic review. Int. J. Behav. Nutr.Phys. Act. 13(1), 127(2016).
- [9] Bonoto,B.C.etal.Efficacyofmobileappstosupportthecareofpatientswithdiabetesmellitus: a systematic review and meta-analysis of randomized controlled trials. JMIR mHealthuHealth. 5(3), e4(2017).
- [10] Whitehead, L. Seaton, P. The effectiveness of self-management mobile phone and tablet apps in long-term condition management: a systematic review. J. Med. Internet Res. 18(5), e97(2016).
- [11] Singh, K. et al. Patient-facing mobile apps to treat high-need, high-cost populations: a scoping review. JMIR mHealthuHealth. 4(4), e136(2016).
- [12] Levine, D. M., Landon, B. E. Linder, J. A. Quality and experience of outpatient care in the United States for adults with or without primary care. JAMA Intern. Med. https://doi.org/10.1001/jamainternmed.2018.6716.(2019).
- [13] Kataria, S. and V. Ravindran. Digital health: a new dimension in rheumatology patient care. Rheumatol Int;2018. DOI:10.1007/s00296-018-4037-x.Ronicke, S., M.C. Hirsch, E. Turk, K. Larionov, D. Tientcheu, and A.D. Wagner. Can adecision support system accelerate rare disease diagnosis? Evaluating the potential impact of Ada DX in a retrospective study. Orphanet JR are Dis;2019.14(1)p:69.DOI:10.1186/s13023-019-1040-6.
- [14] Gossec, L., F. Guyard, D. Leroy, T. Lafargue, M. Seiler, C. Jacquemin, A. Molto, J. Sellam, V. Foltz, F. Gandjbakhch, C. Hudry, S. Mitrovic, B. Fautrel, and H. Servy. Detection of flares by decrease in physical activity, collected using wearable activity trackers, in rheumatoid arthritis or axial spondyloarthritis: an application of Machine-Learning analyses in rheumatology. Arthritis Care Res (Hoboken);2018.DOI:10.1002/acr.2376
- [15] Knitza,J.,D.Vossen,I.Geffken,M.Krusche,M.Meyer,P.Sewerin,A.Kleyer,A.J.Hueber,ad R.ArbeitskreisJunge.[Use of medical apps and online platforms among Germanrheumatologists: Results of the 2016 and 2018 DGRh conference surveys and research conducted by rheumadocs]. Z Rheumatol;2018. DOI:10.1007/s00393-018-0578-3.

- [16] Albrecht, U.V., U. Hillebrand, and U. von Jan. Relevance of Trust Marks and CE Labels in German-Language Store Descriptions of Health Apps: Analysis. JMIR Mhealth Uhealth;2018.6(4)p:e10394. DOI:10.2196/10394.
- [17] Nouri, R., S. R NiakanKalhori, M. Ghazisaeedi, G. Marchand, and M. Yasini. Criteria for assessing the quality of mHealth apps: a systematic review. Journal of the American Medical Informatics Association;2018.25(8)p:1089-1098. DOI:10.1093/jamia/ocy050.
- [18] Stoyanov, S.R., L. Hides, D.J. Kavanagh, O. Zelenko, D. Tjondronegoro, and M. Mani. Mobile app rating scale: a new tool for assessing the quality of health mobile apps. JMIR Mhealth Uhealth;2015.3(1)p:e27. DOI:10.2196/mhealth.3422.
- [19] Grainger, R., H. Townsley, B. White, T. Langlotz, and W.J. Taylor. Apps for People With Rheumatoid Arthritis to Monitor Their Disease Activity: A Review of Apps for Best Practice Quality. JMIR Mhealth Uhealth;2017.5(2)p:e7. DOI:10.2196/mhealth.6956.
- [20] Shrout, P.E. and J.L. Fleiss. Intraclass correlations: uses in assessing rater reliability. Psychol Bull;1979.Mar;86(2)(0033-2909 (Print))p:420-8. DOI:10.1037/0033-2909.86.2.420
- [21] Walker, U.A., R.B. Mueller, V.K. Jaeger, R. Theiler, A. Forster, P. Dufner, F. Ganz, and D. Kyburz. Disease activity dynamics in rheumatoid arthritis: patients' self-assessment of disease activity via WebApp. Rheumatology (Oxford);2017.56(10)p:1707-1712. DOI: 10.1093/rheumatol- ogy/kex229.
- [22] Waite-Jones, J.M., R. Majeed-Ariss, J. Smith, S.R. Stones, V. VanRooyen, and V. Swallow. Young People's, Parents', and Professionals' Views on Required Components of Mobile Apps to Support Self-Management of Juvenile Arthritis: Qualitative Study. JMIR Mhealth Uhealth;2018.6(1)p:e25. DOI:10.2196/mhealth.9179
- [23] Revenas, A., C.H. Opava, C. Martin, I. Demmelmaier, C. Keller, and P. Asenlof. Development of a web-based and mobile app to support physical activity in individuals with rheumatoid arthritis: results from the second step of a co-design process. JMIR Res Protoc;2015.4(1)p:e22. DOI: 10.2196/resprot.3795.
- [24] Turner- McGrievy, G.M., S.B.Hales, D.E.Schoffman, H.Valafar, K.Brazendale, R.G.Weaver, M.W. Beets, M.D. Wirth, N. Shivappa, T. Mandes, J.R. Hebert, S. Wilcox, A. Hester, and M.J. McGrievy. Choosing between responsive-design websites versus mobile apps for your mobile be- havioral intervention: presenting four case studies. TranslBehav Med;2017.7(2)p:224-232. DOI: 10.1007/s13142-016-0448-y.