**Advances
in
Bioresearch**

ORIGINAL ARTICLE

Prevalence of the traditional use of selected medicinal plants in Ha'il region of Saudi Arabia.

[1]Nouf Haya Alsuhaimi,*[2]Njoud Saleh Alanezi, [3]Ranim Fahad Alhejaily,[4] Omar Sahab Alrashidi,[5]Halima Mustafa Elagib

[1,*2,3] Faculty of Medicine, University of Ha'il, Saudi Arabia
[4]Intern doctor, Faculty of Medicine, MedicalUniversity of Warsaw, Republic of Poland
[5] Department of Pharmacology, Faculty of Medicine, University of Ha'il, Saudi Arabia
[5]Department of Pharmacology, Faculty of Pharmacy, Omdurman Islamic University, Sudan
*Corresponding Author's E-mail: njoudsalleh@gmail.com

ABSTRACT
Traditional use of herbal medicines refers to the long historical use of these herbal medicines. Their use is well established and widely acknowledged to be safe and effective, and may be established by national authorities. The aim of the study is to estimate and determine the prevalence, acceptance and effectiveness of selected medicinal plants on the population of Ha·il region of Saudi Arabia. It is a cross-sectional study that was done on 549 people via an online questionnaire. Data analyzed using SPSS version 23 and (Anova and T- Test considering level of significance P≤ 0.001 and P≤ 0.05). The result of this study showed that 81.2% of participants were females compared to 17.8%males. The most commonly used medicinal plant was chamomile (Matricaria chamomilla) with (62.4%) of participants, most commonly used for therapeutic and preventive causes. Then followed by Aloe Vera (Aloe barbadensis miller) with (59.4%) of participants and commonly used for cosmetic reasons. The least common used medicinal plant is Moringa (Moringa oleifera) with (16.3%) of participants commonly used for hyperglycemia and hormonal imbalance. Among participants (82.7%) thought that traditional medicine was effective and (9.4%) did not. Among them (75.9%) recommend using the mentioned medicinal plants, while only (15.3%) thought they should be taken under observation . (53.7%) of participants preferred traditional medicinal plants above modernmedicine. The study showed that medicinal plants are widely used among the residents of Ha·il region.
KEY WORDS: Prevalence, Traditional, Selected, Medicinal, Plants

INTRODUCTION

Medicinal plants are a way of medication since many years ago, until now a days people still use it. According to world health organization (WHO) the definition of traditional use of herbal medicines, "Herbal medicines include herbs, herbal materials, herbal preparations and finished herbal products, which contain as active ingredients parts of plants, or other plant materials, or combinations. Traditional use of herbal medicines refers to the long historical use of these medicines. Their use is well established and widely acknowledged to be safe and effective, and may be established by national authorities. WHO also set up other terms such as for traditional medicine complementary/alternative/non-conventional medicine, which are used interchangeably with traditional medicine in some countries [1].

 Complementary and alternative medicines (CAM) are having a rising popularity with a high prevalence of use worldwide [2].In United States a study on a total of 26157 respondents, 35% of them reported current use of at least 1 herbal medicine [3]. In another a study done on 102 patients with allergy in Western Saudi Arabia, Herbal medicines were used by 60% of participants[4]. In Saudi Arabia, there is a few to little amount of data on the prevalence on the use of medicinal plants, especially in Hail region. *Matricaria chamomill* is a species from the family *Asteraceae.* It is have extensive medicinal values and

perfect pharmacological properties [5].The therapeutic effects of Chamomile are antioxidant, antimicrobial, antidepression, anti-inflammatory, antidiarrheal , angiogenesis activity, anticarcinogenic, hepatoprotective, and antidiabetic effects. Besides, it is beneficial for knee osteoarthritis, ulcerative colitis. In addition to that[6] found theses plant effective against premenstrual syndrome and gastrointestinal disorders .

Aloe vera known as Barbados or Curaçao Aloe from the family *liliaceae*, is an herbal medicine with a history of use by a many of cultures. The plant grows in arid and subtropical climates [7].

Now a day's frequently showed in the field of cosmetology. The history of use of *Aloe vera* in medical purposes have been in several cultures for periods like Greece, Egypt, India, Mexico, Japan and China. [8] Many articles have reported that has a role as anti-Inflammatory and wound healing activity. Moreover[9] mentioned that *Aloe vera* accelerates wound healing by promoting the proliferation and migration of fibroblasts and keratinocytes and by protecting keratinocytes from preservative-induced death.

Moringa oleifera Lama also known as *Moringa pterygosperm* plant, is a member of the family *Moringaceae* of perennial angiosperm plants.

The nutritional values by phytochemical analysis have shown that its leaves are particularly rich in potassium, calcium, phosphorous, iron, essential amino acids vitamins A and D. As well as such known antioxidants such as β-carotene, vitamin C, and flavonoids.It is known as a remedy for malnutrition in many region on Africa for that it labeled as Miracle Tree, Tree of Life, Mother's Best Friend, God's Gift to Man, Savior of the Poor [10].

One of most marked effect of Moringa rather than the nutritional value that it has antioxidant and antidiabetic effects. The significant antioxidant activities of leaves from both in vivo as well as in vitro studies, suggests that the regular intake of its leaves through diet can protect normal as well as diabetic patients against oxidative damage [11].Also has therapeutic potential role in dyslipidemia, anti-nutrient properties by reducing intestinal uptake of dietary cholesterol, antioxidant properties, and anti-inflammatory properties [4].

The primary goal is to have a basic idea on the prevalence of selected medicinal plants. Which are *Matricaria chamomilla L.*, *Aloe barbadensis miller*, and *Moringa oleifera* in the Hail region in the Kingdom of Saudi Arabia.

MATERIAL AND METHODS

Across-sectional survey study conducted in Ha,il and its provinces from Oct 2019 until April 2020.Electronic questionnaire used as the methods of collecting data distributed electronically from Nov 2019 until March 2020. 549 participants (age ranged from ≥19 to ≥30 years) answered the questionnaire which include the questions about the use of three plants*Matricaria chamomilla, Aloe vera and Moringa Oleifera*, 44 excluded because they did not meet the inclusion criteria.

Statistical Analysis

All data were collected, analyzed using (SPSS) V 23.0.The observations for each question are tabulated. Statistical comparison was done using SPSS (Anova and T- Test considering level of significance P≤ 0.001 and   P≤ 0.05)for interpretation of results.

RESULT

Demographic characteristics of participants and association with prevalence and use of the *Matricaria chamomilla, Aloe vera and Moringa oleifera* medicinal plants

549 people participated in the survey during the study period. 44 responses were excluded because they did not meet the inclusion criteria. 505 surveys were successfully completed. The majority of respondents were female with 81.2% and 17.8% were male. Since the study targeted Ha,il region thus participant were mostly from Ha,il (86.3%), Baqaa (8.8%), Al Ghazalah (0.8%), Ash Shamli (1%) and other Hail's regions (2.2%). Other demographic characteristics of the surveyed participants is shown in table no.1.

Table No.1.Demographic characteristics of participants and association with prevalence and use of the three medicinal plants (N=505).

Characteristics	Percentage	Mean	Standard Error of mean	Standard Deviation	P-value
1.Gander		1.82	0.017	0.385	0.0013
Male	91 (17.8)				
Female	414 (81.2)				
2. Age group		2.84	0.042	0.952	0.955
18 ≤	12 (2.4)				
18 – 25	240 (47.1)				
25 – 30	71 (13.9)				
30 ≥	182 (35.7)				
3. Region of origin		1.22	0.032	0.714	0.955
Ha'il	440 (86.3)				
Baqaa	45 (8.8)				
Al Ghazalah	4 (0.8)				
AlShamli	5 (1)				
Other Ha'il region	11 (2.2)				
4. Qualification		3.75	0.530	0.530	0.850
Primary school	6 (1.2)				
Middle school	6 (1.2)				
High school	94 (18.4)				
College and above	399 (78.2)				
5.Employment		3.16	0.069	1.545	0.946
Male student	50 (9.8)				0.021
female student	190 (37.3)				
Male employee	46 (9)				
female employee	134 (26.3)				
Male unemployed	13 (2.5)				0.051
female unemployed	71(13.9)				

(ANOVA and T- Test considering level of significance P≤ 0.001 and P≤ 0.05)

The statistical analysis of demographic data with the use of the selected plants showed significant higher usage of medicinal plants by female 81.2% compared to male 17.8% (P=0.001) . Additionally, there was highly statistically significant lower usage of the medicinal plants in male student (9.8%) (P=0.02) as shown in table no.1.

The source of the knowledge about the uses of three medicinal plants

There was a quiet large number of respondents used the medicinal plants based on social media. The most used plants based on advertising from social media (32.85%), followed by the relatives (28.32%) with significant association in taking relative advice (P=0.001) , followed by knew it by person used it before (19.28%), also with significant association in taking other or persons recommendations seriously (P=0.004), then friend or colleague (13.83%) and   school (3.989%). Only (1.729%) of participants revealed their herbal use to their doctors which showed limited prescription of medicinal plants by doctors in compare to other methods. On other hand only 20 participants with (3.9%) did not know about the mentioned medicinal plants at all as shown in figure no.1 and table no. 2.
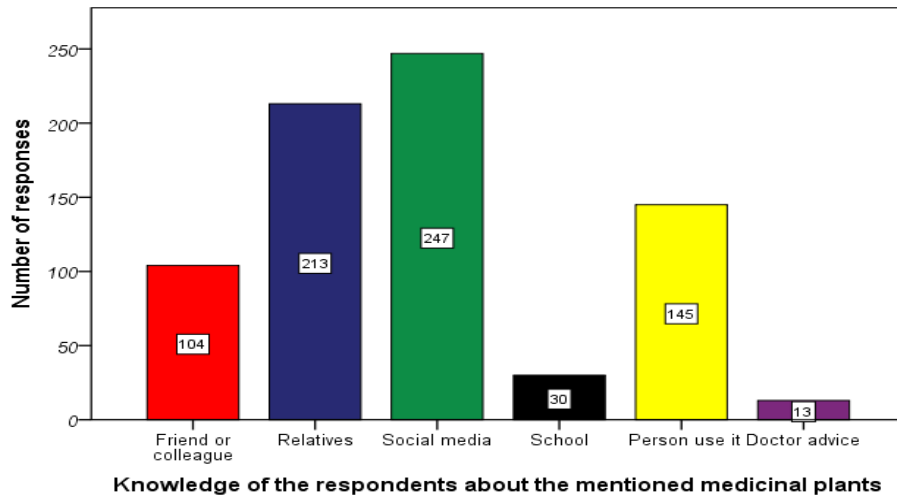
Figure No.1.The source of the knowledge about the mentioned medicinal plants (N=485)

Prevalence uses of the three medicinal plants

Among all respondents, the most commonly used medicinal plant was *Matricaria chamomilla* was 62.4% with 318 responses. The majority used it for therapeutic and preventive reasons, improving digestion, reducing menstrual pain, treating cold symptoms, asthma attack and helping with sleep and relaxation. About the effectiveness statistically showed significant good effect (P=0.001) with approximately no side effect. *Aloe Vera was 59.4%*mostly used in cosmetic reasons for instance as hair growth, acne and burn scars with high association in its good effect (P=0.023).*Moringa oleifera* the least common was16.3% used for hyperglycemia and hormonal imbalance or only as a regular drink as shown in table no.2 figure no. 2.
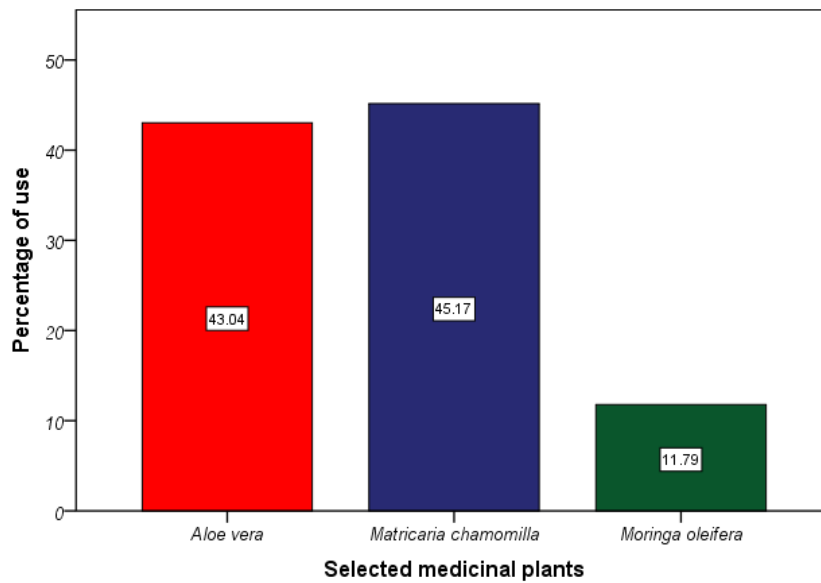

Figure No.2 .Percentage of prevalence of uses of the three medicinal plants(N=485)

Way and time of using the three medicinal plants

Number of participants showed that they preferred using them alone (69%), while (21.2%) preferred mixing them with other plants, even though (32.7%) did not know if they are effective or not and (26.3%) thought the benefits with mixing increased. Also regarding the period of use more than half (63.3%) did not continue using them due to delay of results while (14.5%) use it in a regular basis as shown in table no.2 .

Table No.2 .The pattern of herbal medicine used in the study (N=485)

Patterns	Percentage	Mean	Standard Error of mean	Standard deviation	P-value
1.Source of knowledge	485				
Social Media	247 (48.4)	1.51	0.022	0.500	0.968
Relative	213 (41.8)	1.58	0.022	0.494	0.001
Person use it	145 (28.4)	1.71	0.020	0.453	0.004
Friend or colleague	104 (20.4)	1.79	0.018	0.405	0.822
School	30 (5.9)	1.93	0.012	0.266	0.822
Doctor advice	13 (2.5)	1.97	0.007	0.159	0.546
2.Herbal plants					
Aloe Vera	303 (59.4)	1.40	0.022	0.490	0.023
Matricaria Chamomile	318 (62.4)	1.37	0.022	0.483	0.001
Moringaoleifera	83 (16.3)	1.84	0.017	0.371	0.342
3.Reasons of use					
Therapeutic	257 (50.4)	1.49	0.022	0.500	0.961
Preventive	103 (20.2)	1.80	0.018	0.403	0.825
Cosmetic	274 (53.7)	1.46	0.022	0.499	0.908
4.Way of use	460 (90.2)	1.23	0.020	0.424	0.809
Alone	352 (69)				
Mixed with other plant	108 (21.2)				
5.Mixing result	379 (74.3)	2.72	0.069	1.339	0.966
Increased	134 (26.3)				
Decreased	4 (0.8)				
No difference	74 (14.5)				
Don't know	167 (32.7)				
5.Time of use	477 (87.6)	1.67	0.055	1.159	0.983
3 moths ≤	323 (63.3)				
3 months	22 (4.3)				
3 months ≥	28 (5.5)				
Regular use	74 (14.5)				

(Anova and T- Test considering level of significance P≤ 0.001 and   P≤ 0.05)

Effectiveness and recommendation of the traditional use of the three medicinal plants
The result of this study indicated that (82.7%) thought that traditional medicine was effective, and (9.4%) thought not because of the delay of result or the allergic reaction. Participants recommended using of the mentioned medicinal plants were(75.9%) with association in high recommendation of traditional medicine (P=0.002) while (15.3%) thought they should be taken under observation. Finally among 472 participants 274 (58.05%) preferred the traditional medicine above modern medicines in this study due to little to no side effects which had been significantly associated (P=0.0223) as shown in figure no.3.
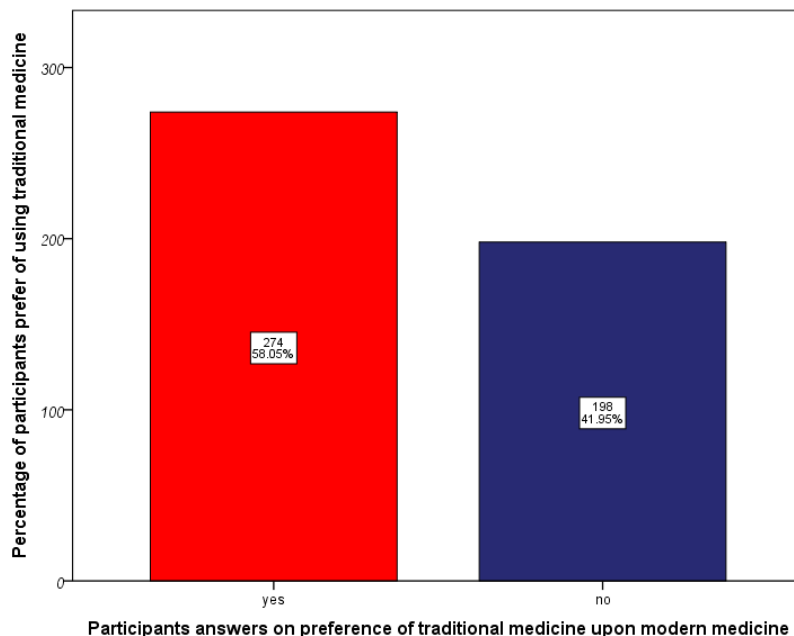
Figure No.3 .Percentage of participants for recommendation for preference of uses the traditional medicinal plants more than modern medicines (N=472)

DISCUSSION

The most important finding in this study was the common use of the above mentioned plants in Ha،il region. The most widely used plant in the region according to our study was *Matricaria chamomilla*, which was used to treat a variety of symptoms, mainly used as a symptomatic treatment for irritable bowel syndrome symptoms, such as bloating and abdominal cramps. Also many people reported it usefulness as a cough reliever. Moreover It was effective for releifing the pain during menstural cycle. The principal use of *Moringa oleifera* tea was to regulate glycemia in diabetic patients and   to treat menstrual cycle irregularity .For *Aloe vera*, the aesthetic uses predominated, including moisturizing the skin and decreasing hair loss.

This in agreement with a cross-sectional study of [12] reported high prevalence of herbal medicine use among 879 pregnant women of different age groups in Ha،il region. Also our result in harmony with study of [13]involved 809 saudi adults found that 711 participants have utilized traditional medicine .In addition to [2] reported a very high use of folk medicine in patients with chronic illnesses such as diabetes and hypertension .

According to *Matricaria chamomilla* in our study indicated that (62.4%) of participant used it for treatment of therapeutic and preventive causes and this coincide with study of [4] conducted in western region of Saudi Arabia showed that it was use by patient with bronchial asthma.

Another study that included 155 Saudi children with acute lower respiratory illnesses pointed the use of *Matricaria chamomilla* to relieve the symptoms [14]. More over another study in patients with generalized anxiety disorder showed that *Matricaria chamomilla* consumption improved symptoms as well as its association with decreasing salivary cortisol [15].

The most commonly used herb among Australian patients with anxiety is *Matricaria chamomilla* [16].

Regarding *Aloe vera* in our study indicated that (59.4%) of participant used it for cosmetic reasons and most of either as a gel or cream, and this is in agreement of [17] demonstrated that was effective for healing wounds of different etiologies such as diabetic ulcers, bedsores and skin burns.

Aloe Vera has a role as protective layer on skin to UV and gamma radiation, effects on the immune system by inhibiting the antigen-antibody-mediated release of histamine and leukotriene from mast cell, a potent laxative causes increases in intestinal peristalsis. Also used as antiviral, antitumor activity, moisturizing, anti-aging effect, hypoglycemic, and antiseptic effect[8].

For *Moringa Oleifera* in our study indicated that (16.3%) of participants commonly used for hyperglycemia and hormonal imbalance and this the same as use it in traditional medicine to help in decreasing blood sugar, increasing insulin and inhibiting the pro-inflammatory mediator nitric acid [18]. In Albaha region, a research about the ethnomedical use of local domestic plants indicated that *Moringa*

oleifera was used in rheumatologic condition and diabetes due to its anti-inflammatory and hypoglycemic effects, respectively [19].

CONCLUSION

There is a high use of medicinal plants among Hail region residents, Most common used medicinal plant was chamomile *(Matricaria chamomilla)* (62.4%),followed by Aloe Vera *(Aloe barbadensis miller)* (59.4%) and the least common used medicinal plant was Moringa *(Moringa oleifera)* (16.3%). Most common use for each medicinal plant was therapeutic and preventive, cosmetic reasons and for hyperglycemia and hormonal imbalance, respectively.

Most of the participants think that the mentioned medicinal plants are effective (82.7%) and (75.9%) recommend using them. The study was limited by low number of participants and needs further research and investigation.

ACKNOWLEDGEMENTS

REFERENCES

1. World Health Organization. (2000). *General guidelines for methodologies on research and evaluation of traditional medicine*. Geneva.
2. Alghamdi, M., Mohammed, A. A., Alfahaid, F., &Albshabshe, A. (2018). Herbal medicine use by Saudi patients with chronic diseases: A cross-sectional study (experience from Southern Region of Saudi Arabia). Journal of Health Specialties, 6(2), 77.
3. Rashrash, M., Schommer, J. C., & Brown, L. M. (2017). Prevalence and Predictors of Herbal Medicine Use Among Adults in the United States. *Journal of Patient Experience*, *4*(3), 108–113.
4. Koshak, A. (2019). Prevalence of herbal medicines in patients with chronic allergic disorders in Western Saudi Arabia. *Saudi Medical Journal*, *40*(4), 391–396.
5. Singh, O., Khanam, Z., Misra, N., & Srivastava, M. (2011). Chamomile (Matricariachamomilla L.): An overview. *Pharmacognosy Reviews*, *5*(9), 82.
6. Miraj, S., &Alesaeidi, S. (2016). A systematic review study of therapeutic effects of Matricariarecuitta chamomile (chamomile). *Electronic Physician*, *8*(9), 3024–3031.
7. 7.Grundmann, O. (2012). Aloe Vera Gel Research Review An overview of its clinical uses and proposed mechanisms of action. *Natural Medicine Journal*, *4*(9).
8. Surjushe, A., Vasani, R., &Saple, D. (2008). Aloe vera: A short review. *Indian Journal of Dermatology*, *53*(4), 163.
9. Teplicki, E., Ma, Q., Castillo, D. E., Zarei, M., Hustad, A. P., Chen, J., & Li, J. (2018). The Effects of Aloe vera on Wound Healing in Cell Proliferation, Migration, and Viability. *Wounds : a compendium of clinical research and practice*, *30*(9), 263–268.
10. Mbikay, M. (2012). Therapeutic Potential of Moringaoleifera Leaves in Chronic Hyperglycemia and Dyslipidemia: A Review. *Frontiers in Pharmacology*, *3*.
11. Jaiswal, D., Rai, P. K., Mehta, S., Chatterji, S., Shukla, S., Rai, D. K., … Watal, G. (2013). Role of Moringaoleifera in regulation of diabetes-induced oxidative stress. *Asian Pacific Journal of Tropical Medicine*, *6*(6), 426–432.
12. Aljofan, M., &Alkhamaiseh, S. (2020). Prevalence and Factors Influencing Use of Herbal Medicines During Pregnancy in Hail, Saudi Arabia: A cross-sectional study. *Sultan Qaboos University Medical Journal [SQUMJ]*, *20*(1), 71.
13. AlAkeel, M. M., Al Ghamdi, W. M., Al Habib, S., Koshm, M., & Al Otaibi, F. (2018). Herbal medicines: Saudi population knowledge, attitude, and practice at a glance. *Journal of family medicine and primary care*, *7*(5), 865–875.
14. Alharbi, N., Alenizi, A., Al-Olayan, A., Alobaidi, N., Algrainy, A., Bahadhailah, A., … Alrohaimi, Y. (2018). Herbs use in Saudi children with acute respiratory illnesses. *Sudanese Journal of Paediatrics*, 20–24.
15. Keefe, J. R., Guo, W., Li, Q. S., Amsterdam, J. D., & Mao, J. J. (2018). An exploratory study of salivary cortisol changes during chamomile extract therapy of moderate to severe generalized anxiety disorder. *Journal of Psychiatric Research*, *96*, 189–195.
16. Mcintyre, E., Saliba, A. J., Wiener, K. K., & Sarris, J. (2016). Herbal medicine use behaviour in Australian adults who experience anxiety: a descriptive study. *BMC Complementary and Alternative Medicine*, *16*(1).
17. Hekmatpou, D., Mehrabi, F., Rahzani, K., &Aminiyan, A. (2019). The Effect of Aloe Vera Clinical Trials on Prevention and Healing of Skin Wound: A Systematic Review. *Iranian journal of medical sciences*, *44*(1), 1–9.

18. Salehi, B., Ata, A., V Anil Kumar, N., Sharopov, F., Ramírez-Alarcón, K., Ruiz-Ortega, A., AbdulmajidAyatollahi, S., TsouhFokou, P. V., Kobarfard, F., AmiruddinZakaria, Z., Iriti, M., Taheri, Y., Martorell, M., Sureda, A., Setzer, W. N., Durazzo, A., Lucarini, M., Santini, A., Capasso, R., Ostrander, E. A.,Sharifi-Rad, J. (2019). Antidiabetic Potential of Medicinal Plants and Their Active Components. *Biomolecules*, *9*(10), 551.
19. Ali, N. A., Sokari, S. A., Gushash, A., Anwar, S., Al-Karani, K., & Al-Khulaidi, A. (2017). Ethnopharmacological survey of medicinal plants in Albaha Region, Saudi Arabia. *Pharmacognosy Research*, *9*(4), 401.