RESEARCH ARTICLE

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Determining individuals' knowledge, attitudes, and experiences concerning sumac (*Rhus coriaria* L.)

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Abstract
The aim of this study is to determine the individuals' knowledge, attitudes, and experiences concerning sumac (*Rhus coriaria* L.). The researchers collected the data from 139 participants, living in the cities of Siirt and Mardin, by using a survey, prepared based on the relevant literature, between 01 July and 15 August 2021. The mean age of the participants was 24.42±4.44 (min:18 – max:65) and 82.0% of them were female. 45.3% of the participants had an undergraduate or higher education. 81.3% of the participants stated that they had knowledge about the health benefits of sumac. 74.1% of them stated that they obtained this information from their family, partner, friend, and relatives. When the frequency of consuming sumac was evaluated, 28.1% of the participants stated that they consumed it once a week and 20.9% every day. 80.6% of the participants stated that sumac was effective for the treatment of stomach disorders, 79.9% for the treatment of infection, 74.1% for the treatment of influenza, 67.6% for alleviating respiratory distress, 63.3% for the treatment of gastric ulcer, and 59.7% for lowering blood pressure. Based on the experiences of the individuals, it was determined that sumac was effective for the treatment of stomach disorders (80.6%), the treatment of infection (79.9%), the treatment of influenza (74.1%), alleviating respiratory distress (67.6%), the treatment of gastric ulcer (63.3%), and lowering blood pressure (59.7%).
Keywords: Sumac, Rhus Coriaria L., Knowledge, Attitude, Experience

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INTRODUCTION

Rhus coriaria L. (Anacardiaceae), locally known as Sumac, is gathered in autumn. It is used in the form of powder or boiled with a certain amount of water. The plant is used in two forms: fruit and leaf (Yücel et al., 2011). *Rhus coriaria* is the only Rhus species grown in Turkey. It is distributed in the Mediterranean, Aegean, Southeastern Anatolia, Northern Anatolia, Thrace, and Central Anatolia regions in Turkey (Koyuncu and Köroğlu, 1991).

Sumac, which is mostly used as a culinary spice, has also been employed in traditional medicine to treat various illnesses such as liver diseases, diarrhoea, urinary problems, gastric ulcers, dysentery, haemorrhoid, and gout and is also often utilised for healing wounds and lowering blood glucose, cholesterol, and uric acid levels (Sakhr & El Khatib, 2020; Candan, 2003; Rayne & Mazza, 2007; Shabbir, 2012). It has been reported that sumac has antibacterial, antiviral, antifungal, anticandidal, antiulcer, antiseptic, and antihepatoxic effects due to gallic and ellagic acid, quercetin, isoquercetin, isoquercetin myricetin, myricitrine, and tannin in its composition (Candan, and Sökmen, 2004; Gıancarlo et al., 2006; Gülmez et al., 2006). The studies have revealed that R. coriaria is antimicrobial, antifungal, antiviral (Rayne & Mazza, 2007), antioxidant (Bozan et al., 2003), anti-

inflammatory (Panico et al., 2009), hepatoprotective (Pourahmad et al., 2010), and cardiovascular protective effects (Beretta et al., 2009) have important biological effects. Many previous in vitro and in vivo animal and human studies revealed the potential of sumac to lower blood glucose (Gupta et al., 2005; Ahangarpour et al., 2014; Shidfar et al., 2014; Abedi Gaballu et al., 2015; Salimi et al., 2015; Pourahmad et al., 2010).

Rhus coriaria fruit contains a wide range of bioactive compounds that can be beneficial to humans and are active in wound healing processes. A mouse study reported that cream formulated from sumac treated excision and burn wounds more effectively than commercial creams (Alsarayreh et al., 2021). As a result of the literature review, no article on the experiences of the people regarding the use of sumac was found. This study aims to fill this gap in the literature.

In the light of this information, this study was conducted to determine the knowledge, attitudes, and experiences of individuals living in the cities of Mardin and Siirt concerning sumac (*Rhus coriaria* L.).

MATERIALS AND METHODS

This cross-sectional study was conducted to determine the knowledge, attitudes, and experiences of individuals concerning sumac.

Everyone who could be reached within the specified time period was included in the sample without any sampling method. The sample consisted of individuals between the ages of 18-69 who were actively using the internet-social media (E-Mail, WhatsApp, Instagram, Facebook etc.), were living in the cities of Siirt and Mardin, and voluntarily agreed to participate in the study.

The researchers collected the data from 139 individuals who were living in the cities of Siirt and Mardin and using actively internet-social media (E-Mail, WhatsApp, Instagram, Facebook etc.) by using a survey prepared based on the relevant literature between 01 July and 15 August 2021.

The data collection form consists of 9 questions including demographic questions such as gender, age, etc., 4 questions including the use of sumac, frequency of use, having information about sumac, etc., and 1 open-ended question that determines the experiences of individuals who examine sumac crops. The second part consists of 10 questions about what sumac is effective in line with the literature (Table1, Table2, Table3).

Ethical Considerations

Ethics committee approval was obtained from Gümüşhane University Scientific Research and Publication Ethics Committee in order to conduct the study.

Statistical Analysis

Means, median, frequencies, and percentage were used as descriptive statistics to show the results.

RESULTS

The mean age of the participants in the study was 24.42±4.44 (min:18 – max:65) and 82.0% of them were female. 45.3% of the participants had an undergraduate or higher education, and 70.5% stated that they were unemployed. More than half of the individuals (69.1%) reported that their income level was moderately high. More than half of the participants (62.6%) stated that their health status was good (Table 1).

As a result of the statistical analysis, it was found that there was a significant difference only between gender and sumac use among sociodemographic characteristics and gender and sumac use was more common among women ($p<0,001$).

All of the participants stated that they used natural or herbal approaches. 81.3% of the participants stated that they knew about the health benefits of sumac. 74.1% of them stated that they obtained this information from their family, partner, friend, and relatives. When the frequency of consuming sumac was evaluated, 28.1% of the participants stated that they consumed it once a week and 20.9% every day (Table 2).

The benefits of sumac were evaluated based on the own experiences of those who used sumac. 80.6% of the participants stated that sumac was effective for the treatment of stomach disorders, 79.9% for the treatment of infection, 74.1% for the treatment of influenza, 67.6% for alleviating respiratory distress, 63.3% for the treatment of gastric ulcer, and 59.7% for lowering blood pressure (Table 3).

Table 1. Socio-demographic characteristics

	n	%
Gender		
Female	114	82.0
Male	25	18.0
Educational background		
Illiterate	3	2.2
Primary school	7	5.0
Secondary school	13	9.4
High school	53	38.1
Undergraduate and higher	63	45.3
Employment status		
Yes	41	29.5
No	98	70.5
Occupation		
Civil-servant	15	10.8
Self-employed	11	7.9
Worker	15	10.8
Unemployed	98	70.5
Income level		
Low	28	20.1
Middle	96	69.1
High	15	10.8
Longest lived place of residence so far		
Village/Town	12	8.6
Province	32	23.0
District	95	68.3
How do you define your health?		
Poor	2	1.4
Moderate	50	36.0
Good	87	62.6

Table 2. Characteristics related to the use of sumac

	n	%
Do you have knowledge about the health benefits of sumac products?		
Yes	113	81.3
No	26	18.7
If so, where did you obtain this information from?		
Radio- Television	39	28.1
Newspaper – Magazine	13	9.4
Healthcare professionals	17	12.2
Family, Partner, Friend, Relative	103	74.1
Other	6	4.3
Frequency of consuming sumac		
Every day	29	20.9
Once a week	39	28.1
Once every 15 days	15	10.8
Rarely	56	40.3

Table 3. Experiences of sumac users

	Sumac			
	Effective		Ineffective	
	n	%	n	%
Alleviating respiratory distress	94	67.6	45	32.4
Stomach disorders	112	80.6	27	19.4
Lowering blood pressure	83	59.7	56	40.3
As an antiseptic	72	51.8	67	48.2
As a diuretic	70	50.4	69	49.6
Periodontal diseases	71	51.1	68	48.9
As a blood glucose regulator	59	42.4	80	57.6
Treatment of influenza	103	74.1	36	25.9
Treatment of infection	111	79.9	28	20.1
Gastric ulcer	88	63.3	51	36.7

DISCUSSION

Rhus coriaria (RC), commonly known as sumac, is a medicinal spice known for its anti-lipidemic, anti-fibrogenic, anti-inflammatory, antidiabetic, antioxidant, anti-ischemic, antithrombotic, antihypertensive and hypoglycaemic properties obtained from human and animal studies (Ardalani et al., 2016; Hajmohammadi et al., 2018; Hariri et al., 2020; Heydari et al., 2019; Sabzghabaee et al., 2014; Shidfar et al., 2014).

In the study, 81.3% of the participants reported that they had knowledge about the health benefits of sumac and 74.1% reported that they obtained this information from their family, spouse, friend, and relative. 20.9% of the participants stated that they consumed sumac every day. When the benefits of sumac were assessed based on individuals' own experiences, it was determined that sumac was effective for the treatment of stomach disorders (80.6%), the treatment of infection (79.9%), the treatment of influenza (74.1%), alleviating respiratory distress (67.6%), the treatment of gastric ulcer (63.3%), and lowering blood pressure (59.7%).

A meta-analysis reported that sumac may be beneficial in patients with metabolic syndrome and related disorders (Ghafouri et al., 2021). Likewise, it has been reported in the literature that daily intake of sumac may help in the treatment and/or prevention of metabolic syndrome and related diseases such as inflammation, cancer, and atherosclerosis (Khalil et al., 2021 b). The studies have revealed that sumac has positive effects on the lipid profile. (Hajmohammadi et al., 2018; Madihi et al., 2013; Rouhi-Boroujeni et al., 2016; Moon et al., 2015; Ehsani et al., 2022). However, in a meta-analysis, no definite conclusion could not be achieved about the effect of sumac on serum blood lipids (Akbari-Fakhrabadi et al., 2018).

The studies have reported that sumac consumption was effective in lowering blood glucose (Doğan and Çelik, 2016). In a meta-analysis, it was reported that sumac did not have a significant effect on various glycaemic indices such as fasting blood glucose level, HbA1c, insulin level and insulin resistance. However, as a result of the subgroup analysis, it was reported that there was a significant decrease in fasting blood glucose level (period ≥12 weeks and dose ≥2 g/day) and insulin resistance (BMI ≥30 kg/m2 and period <12 weeks) (Mohit et al., 2021).

In the study conducted by Gezici in 2019 it was found that sumac extracts inhibited the growth of lung cancer cells in a dose-dependent manner and stated that sumac fruits may have an important potential as an anti-lung cancer agent (Gezici, 2019). In another study, it was shown that sumac at 50 and 100 µM doses significantly inhibited the growth, proliferation, and viability of cancer cells (Gabr and Alghadir, 2021).

In a study, it was found that sumac fruit extract showed an antiviral activity against Herpes simplex virus 1 (Parsania et al., 2017). Another study revealed that the anti-neuroinflammatory activity of sumac included inhibition of the NF-kB signalling pathway (Khalil et al., 2021). All these study results support the sumac-related experiences of the individuals participating in the present study.

CONCLUSION

Consequently, it was found in the present study that the frequency of consuming sumac was 28.1% once a week and 20.9% every day. When the benefits of sumac were evaluated based on individuals' own experiences, it was observed that sumac was effective for the treatment of stomach disorders (80.6%), the treatment of infection (79.9%), the treatment of influenza (74.1%), alleviating respiratory distress (67.6%), the treatment of gastric ulcer (63.3%), and lowering blood pressure (59.7%).

It is recommended to conduct studies with larger samples and to increase the number of randomized controlled trials on this subject. It is important to use herbal approaches consciously. It is recommended to conduct larger studies on side effects and drug interactions that may occur especially in overdose.

COMPLIANCE WITH ETHICAL STANDARDS

Peer-review

Externally peer-reviewed.

Conflict of interest

The authors declare that they have no competing, actual, potential or perceived conflict of interest.

Author contribution

The contribution of the authors to the present study is equal. All the authors read and approved the final manuscript. All the authors verify that the text, figures, and tables are original and that they have not been published before.

Ethics committee approval

Ethics committee approval was obtained from Gümüşhane University Scientific Research and Publication Ethics Committee in order to conduct the study.

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Data availability

Not applicable.

Consent to participate

Not applicable.

Consent for publication

Not applicable.

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