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Research Article

Social Problem-Solving Skills and Empathy Levels of Veterinary Clinicians in Türkiye

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ABSTRACT

This study aimed to investigate the impact of the social problem-solving skills and empathy capacity of veterinary clinicians on their professional practice and to identify the major influential factors involved. For this purpose, 454 veterinary clinicians were enrolled in an online survey. Data was collected by applying a personal information sheet, the Social Problem Solving Inventory-Revised scale, and the Basic Empathy Scale. There was a negative correlation between clinicians' social problem-solving skills and general empathy capacity ($P<0.001$; $r=-0.153$) and emotional empathy capacity ($P<0.001$; $r=-0,255$); a positive correlation between social problem-solving skills and cognitive empathy capacity ($P<0.01$; $r=0.131$). The study results showed that female had a greater capacity for empathy ($P<0.05$). It was determined that the participants' general empathy capacity ($P<0.05$; $r=-0.098$) and emotional empathy capacity ($P<0.05$; $r=-0.102$) decreased with a longer career as a veterinary clinician. The question *"If you had the chance to choose, would you opt again for being a veterinarian?"* was responded to with a *"no"* by clinicians with high emotional empathy ($P<0.01$) and with a *"yes"* by clinician with high social problem-solving skills ($P<0.05$) As a result, it could be speculated that activities such as veterinary faculty curriculum development or in-service courses on the improvement of cognitive empathy capacity would contribute to enhancing the performance of veterinary clinicians in dealing with problems.

Keywords: Cognitive empathy, Emotional empathy, Social problem solving, Türkiye, Veterinarians

Introduction

A social problem is described as the failure of a person to fulfill a task or responsibility during the course of daily life [1]. Since social problems arise from the behavioral, emotional, and social troubles a person faces in his or her living environment, they may potentially affect the environmental adaptability and quality of life of this person. Given that social problems may also negatively affect a person's interactions with other members of society, social problem-solving skills are crucial to the daily life of an individual. In social problem solving, individuals should be effective in analyzing the situation, using and developing strategies [1,2].

In order to solve a social problem, it is required that one first communicate with his or her counterpart to accurately identify the problem in question. Empathy enables us to apprehend the intention and predict the behavior of others, experience feelings, and thereby, effectively interact with people in social settings. Baron-Cohen and Wheelwright [3] describe empathy as the "glue" of the social environment, which inclines us to help others and abstain from hurting their feelings. Empathy is classified into two types: cognitive and emotional. Cognitive empathy (CE) is described as the ability to understand and accurately assess another person's perspective and emotional state, while emotional empathy (EE) is described as the ability to feel another person's emotions. While "friendly feelings" are at the forefront of emotional empathy, "perspective-taking" is important for cognitive empathy [4]. From this standpoint, empathy is considered to have a critical role in the ability to solve social problems [5,6].

In clinical practice, veterinary clinicians are in continual communication with both animals and animal owners and, thus, are frequently faced with social problems. The empathy capacity of the individual is one of the several determining factors of the smooth continuation of the communication process [6]. It is suggested that, by contributing to the solution of social problems, high empathy capacity of the clinician may increase the

satisfaction of the animal owner with the healthcare service provided, as well as the confidence of the animal owner in the clinician and his or her "customer loyalty" [7-9]. Furthermore, empathy capacity enhances the interpretation of clinical symptoms by veterinary clinicians by enabling occupational satisfaction and reducing work stress, -and thus, - can increase the success rate of the treatment employed by them [10].

While literature is available on the correlation between social problem-solving skills and empathy capacity for various professions and groups [11-14], to our knowledge, there is no previous study investigating this topic for the veterinary medical profession in Türkiye. The investigation of the impact of the social problem-solving skills and empathy capacity of veterinary clinicians could contribute to identifying shortcomings or weaknesses and actions for improvement such that potential adversities are prevented.

This study aimed to investigate the impact of the empathy capacity of veterinary clinicians on their social problem-solving skills and to demonstrate any demographic variable-based difference in empathy capacity and problem-solving skills in Türkiye.

Material and Methods

Ethical Statement

This study was approved by Fırat University Social and Human Sciences Research Ethics Committee (Approval no: 06/24-07.04.2022).

Study Design

The social problem-solving skills and empathy capacity of veterinary clinicians in Türkiye were measured using the Social Problem Solving Inventory-Revised (SPSI-R) [15] and the Basic Empathy Scale (BES) [16], respectively. Demographic variables were determined by means of a personal information sheet.

Social Problem Solving Inventory-Revised

This is a 25-item scale developed by D'Zurilla et al.[17]. Each item is rated on a 5-point Likert scale ranging from 0 (not at all true for me) to 4 (extremely true for me). The scale was adapted to Turkish, validity and reliability analyses were performed, and accordingly, the Cronbach alpha reliability coefficient of the scale was computed as 0.85 [15].

Basic Empathy Scale

Developed by Jolliffe and Farrington [18], this is a 20-item scale based on four basic feelings, namely, fear, sadness, anger, and happiness, and includes subscales of cognitive empathy and emotional empathy. Cognitive empathy occur 9 items (items 3, 6, 9, 10, 12, 14, 16, 19, 20), and emotional empathy occur 11 items (items 1, 2, 4, 5, 7, 8, 11, 13, 15, 17, 18). The items are rated on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (totally agree) [18]. The adaptation of the scale to Turkish and the validity and reliability analyses were performed by Topçu et al.[16]. Based on the analyses of this scale, the Cronbach alpha reliability coefficient was computed as 0.79 [16].

Personal Information Sheet

This form was prepared by the researchers to collect data on the sociodemographic characteristics of the respondents (age, gender, marital status, parentage of children, university of graduation, years of professional experience (career length), location of veterinary clinic, specialization area of veterinary clinic, pet ownership, whether a career in veterinary was intentionally chosen as a profession, occupational satisfaction).

The study was based on a correlational research design [19]. In order to minimize face-to-face interactions and facilitate the participation of veterinary clinicians, the survey was designed as a Google form, and data was collected online. The online survey was designed to include an informed consent form on the first page and be launched in the event that the respondent agreed to participate in the survey. Data was collected during the period between 21.04.2022-19.05.2022.

Participants

Since there is no reliable data on the number of veterinarians working in the clinics, the total number of veterinarians in Türkiye has been taken into account. The total number of veterinarians in Türkiye has been reported as 40.000 by the Turkish Veterinary Medical Association [20]. Considering that the population is at least 40.000, it is recommended that the sample size be between 378-381 [21]. Therefore, it was aimed to include at least 400 respondents in the study. Some participants were sent questionnaires directly to their phones (requested support from clinicians to reach more participants and they sent the questionnaire to other clinicians after completing), while others were contacted by veterinary groups via social media and asked to complete the questionnaire (the survey was shared in groups of veterinary clinicians). All veterinary faculty graduates in Türkiye have been reached (Afyon Kocatepe Univ., Aksaray Univ., Ankara Univ., Atatürk Univ., Aydın Adnan Menderes Univ., Balıkesir Univ., Bingöl Univ., Burdur M.A. Univ., Bursa Uludağ Univ., Çukurova Univ., Dicle Uni., Erciyes Univ., Fırat Univ., Harran Univ., Hatay Mustafa Kemal Univ., Istanbul Univ., Kafkas Univ., Kırıkkale Univ., Near East Univ., Ondokuz Mayıs Univ., Selçuk Univ., Siirt Univ., Sivas Cumhuriyet Univ., Tekirdağ Namık Kemal Univ. and Van Yüzüncü Yıl University).

Statistical Analysis

Since the scale was applied on a new sample, Explanatory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) were performed to examine the compatibility between the scales and the data set before starting the analysis of the data. For this purpose, to understand whether there is a correlation between variables, Bartlett's test of sphericity; Kaiser–Meyer–Olkin (KMO) test was performed to measure the adequacy of the sample size. For fit assessment, fit indices X^2 (chi square)/df (degrees of freedom), Standardized Root Mean Square Residual (SRMR), Root Mean Square Error of Approximation (RMSEA) were used. JAMOVI 2.2.5 package program [22] was used in these analyzes. After revealing the compatibility between the scale and the data set, the study data was analyzed with the SPSS 22 software [23]. Frequency and percentage distribution was made for the data. Kolmogorov Smirnov test was used to examine the distribution of data. Independent t-test was used in paired group comparisons, and the Anova test was used in comparisons of 3 or more groups. Duncan and Games Howell test from post hoc tests were made according to the equality of variances. Pearson's correlation test was used to determine the level and direction of the correlation between the demographic data and scale scores.

Results

The responses of 454 of the participants were included in the study. Due to the design of the questionnaire, there is no missing data in terms of any question. As a result of EFA for SPSI-R, 5 factors with an eigenvalue above 1 were formed. The values in Bartlett's test of sphericity and KMO were calculated as P<0.001 and 0.858, respectively. The total variance explanation level was 49.4%. As a result of CFA, X^2/df value was calculated as 2.56, SRMR value was 0.067, RMSEA value was 0.058. There were 4 factors with an eigenvalue above 1 for BES. The values in Bartlett's test of sphericity and KMO were calculated as P<0.001 and 0.866, respectively. The total variance explanation level was 53.5%. As a result of CFA, X^2/df value was calculated as 3.66, SRMR value was 0.064, RMSEA value was 0.076. The Cronbach alpha coefficients of the BES and SPSI-R were calculated as 0.828 and 0.844, respectively.

The sociodemographic characteristics of the respondents are presented in *Table 1*. In the present study, the SPSI-R, BES, EE, and CE scores were determined not to display any statistically significant difference for the following variables: age, marital status, parentage of children, university of graduation, location of veterinary clinic, specialization area of veterinary clinic, pet ownership, and whether a career in veterinary medicine was intentionally chosen as a profession (P>0.05).

Table 1. *Sociodemographic characteristics of the participants*

Variables		**N**	**%**
Gender	Female	110	24.2
	Male	344	75.8
Age (years)	30 and below	187	41.2
	31-40	167	36.8
	41-50	69	15.2
	51 and above	31	6.8
Marital status	Married	288	63.4
	Single	166	36.6
Status of having children	Yes	231	50.9
	No	223	49.1
Working year as a veterinary clinician	5 and below	220	48.5
	6-10	91	20.0
	11-15	53	11.7
	16-20	37	8.1
	21-25	29	6.4
	26 and above	24	5.3
Where the clinic is located	Big city	184	40.5
	Provincial center	67	14.8
	District	183	40.3
	Village	20	4.4
Working area of the clinic	Pet	191	42.1
	Farm	137	30.2
	Mix	126	27.7
Pet ownership status	Yes	286	63.0
	No	168	37.0
Did you choose the veterinary profession willingly?	Yes	402	88.5
	No	52	11.5
If you had the chance to choose, would you opt again for being a veterinarian?	Yes	329	72.5
	No	125	27.5

The BES scores of the respondents significantly differed for the gender variable, and female were observed to score higher points (P<0.05). Furthermore, the BES- and SPSI-R-based comparison of the responses given to the question "*If you had the chance to choose, would you opt again for being a veterinarian?*" demonstrated statistically significant differences (P<0.01). Participants who had responded with a *"no"* to this question had higher BES scores, and those who had responded with a *"yes"* to the question had higher SPSI-R scores *(Table 2)*.

The breakdown of the total scores calculated according to the answers given by the participants to the sets is as follows: 65.89 (min:0, max:100) for the SPSI-R; 59.13 (min:20, max:100) for the BES; 30.13 (min:9, max:45) for CE; and 29.00 (min:11, max:55) for EE.

Table 2. *Comparison of scores obtained from BES, SPSI-R, EE and CE with sociodemographic variables*

Variable	Gender	N	Mean	t	df	P
BES	Female	110	59.8545	2.068	452	*0.039*
	Male	344	58.9041			
Variable	***If you had the chance to choose, would you opt again for being a veterinarian?***					
BES	Yes	329	58.8055	-2.719	452	*0.007*
	No	125	60.0000			
EE	Yes	329	28.6657	-3.265	452	*0.001*
	No	125	29.8800			
CE	Yes	329	30.1398	0.093	452	0.926
	No	125	30.1200			
SPSI-R	Yes	329	66.8815	3.324	452	*0.001*
	No	125	63.2960			

BES: Basic Empathy Scale, EE: Emotinal Empathy, CE: Cognitive Empathy, SPSI-R: Social Problem Solving Inventory-Revised, N: Number, df: Degrees of freedom, P: Probability

Table 3. *Correlation results between scores obtained from BES, SPSI-R, CE and EE*

Variables		SPSI-R	Working Year as a Veterinary Clinician
BES	Pearson correlation	**-0.153****	**-0.098***
	P	0.001	0.037
	N	454	454
CE	Pearson correlation	0.131**	-0.024
	P	0.005	0,616
	N	454	454
EE	Pearson correlation	-0.255**	-0.102*
	P	0.000	0.030
	N	454	454

**Correlation is significant at the 0.01 level, ** Correlation is significant at the 0.05 level, BES: Basic Empathy Scale, CE: Cognitive Empathy, EE: Emotinal Empathy, SPSI-R: Social Problem Solving Inventory-Revised, P: Probability, N: Number*

An assessment of the correlation between the BES scores, SPSI-R scores and variables demonstrated that the SPSI-R, score was negatively correlated with the BES and EE scores and positively correlated with the CE score (P<0.01). Furthermore, a longer career as a veterinary clinician was determined to be negatively correlated with the BES and EE scores (P<0.05) (*Table 3*).

Discussion

As time-dependent changes in attitude cannot be monitored with the use of the cross-sectional data collection technique, a longitudinal study design could be preferred in future studies for stronger speculations. Furthermore, as online communication was established with the respondents in the present study, a proportionate stratification of the sample could not be made for the sociodemographic variables. This may have led to a bias in favor of the male respondents, respondents younger than 30 years of age, and respondents with a work experience of less than 5 years.

This study was aimed at investigating the impact of the empathy capacity of veterinary clinicians working in Türkiye on their social problem-solving skills and determining the correlation between sociodemographic characteristics, social problem-solving skills, and empathy capacity.

If the Bartlett sphericity test analysis result is at a significant level (P<0.05), the data; KMO coefficient greater than 0.60 indicates that the sample is suitable for factor analysis [24]. As a result of Bartlett sphericity (for both scales: P<0.001) and KMO tests (for SPSI-R: 0.858; for BES: 0.866), it was understood that the scales were suitable for EFA. Total variance explanation level for SPSI-R and BES were calculated 49.4% and 53.5%, respectively. Total variance explanation level between 40% and 60% is considered

sufficient [23]. X^2/df values <5, SRMR and RMSEA values of ≤0.08 indicate that the model and the data set are compatible [25,26]. Values for SPSI-R were X^2/df: 2.56; SRMR: 0.067; RMSEA; 0.058 and for BES were X^2/df :3.66, SRMR: 0.064, RMSEA: 0.076. It was determined that the values for both scales were within these reference ranges and therefore the scale and the data set were compatible.

Cronbach's alpha coefficients were examined for the reliability of the scales used in the study. A scale's Cronbach's alpha coefficient above 0.80 indicates a high level of reliability [23]. As the alpha coefficients were above 0.80 (SPSI-R: 0.844, BES: 0.828), both scales were confirmed to be highly reliable.

The study results revealed that, among the variables tested, age, marital status, parentage of children, years of professional experience, location of a veterinary clinic, specialization area of a veterinary clinic, pet ownership, and whether a career in veterinary medicine was intentionally chosen as a profession did not bring about any difference in the attitudes of the respondents toward empathy capacity or problem-solving skills.

Research has demonstrated that, in general, female show greater empathy towards both humans and animals [3,27-29]. Similarly, reports indicate that, compared to their male colleagues, female veterinarians [30], and compared to male students, female students of veterinary faculties, have a more empathetic attitude [7,31-35]. Likewise, in the present study, it was determined that while the empathy capacity of the respondents significantly differed by gender, female showed a stronger empathetic attitude than male (P<0.05). This could be explained by the recently proposed empathizing-systemizing theory. Accordingly, the female brain is predominantly hard-wired for empathy, and the male brain is predominantly hard-wired for understanding and building systems [36].

Respondents who gave the answer *"no"* to the question *"If you had the chance to choose, would you opt again for being a veterinarian?"* were observed to have a stronger empathetic attitude (P<0.01). The assessment of the subscales of the BES for the responses given to this question also showed that the respondents who gave the answer *"no"* had a stronger empathetic attitude with respect to emotional empathy (P<0.01). Emotional empathy describes the ability to apprehend and feel the emotions of others, give an emotional reaction to the prevailing circumstances, identify with others, and sympathize with their states [37]. Reports suggest that, as individuals with greater emotional empathy capacity tend to feel others' emotions, they show a higher level of sympathy for negative feelings and troubles [31,38] and suffer more from personal anxiety and distress [39,40]. From this viewpoint, veterinary clinicians with a tendency to sympathize with the negative feelings and distress of animal owners may have responded *"no"* to the question "*If you had the chance to choose, would you opt again for being a veterinarian?"* as a reaction to their continuous exposure to stress.

Respondents with high social problem-solving skills were observed to have responded with a *"yes"* to the question, "*If you had the chance to choose, would you opt again for being a veterinarian?"* (P<0.05). In view of social problem-solving skills reflecting the ability of an individual to successfully achieve tasks and responsibilities in daily life [1,2], it could be said that the success veterinary clinicians achieve in their professional practice generates work satisfaction for them.

In the present study, it was observed that social problem-solving skills were negatively correlated with empathy capacity. When assessed for the subscales of empathy, social problem-solving skills were determined to be negatively correlated with emotional empathy capacity and positively correlated with cognitive empathy capacity (P<0.01). Social problem-solving is a process that requires an accurate understanding of the problem, the establishment of viable options, and the selection and application of the most reasonable option [1]. Understanding the perspective of the counterpart plays an important role in solving social problems [40]. On the other hand, cognitive empathy is described as the ability to understand and accurately assess someone's emotional state [4]. In agreement with the previous studies referred to above, the results of the present study suggest that increased cognitive empathy capacity is associated with increased social problem-solving skills. In view of the fact that emotional empathy refers to the ability to feel the emotions of others and sympathize with them [4], it is possible for veterinary clinicians with strong emotional empathy capacities to establish an emotional bond with the people they encounter, bear their feelings, and fail to make an objective evaluation of the social problems they face [41]. This may have led to the respondents with high EE scores scoring fewer points on the SPSI-R.

The present study demonstrated that a longer career as a veterinary clinician was associated with weaker empathy capacity (P<0.05). Based on the assessment of empathy subscales, this was considered to be related to emotional empathy (P<0.05). Previous studies in this area have reported that empathy capacity decreases with longer years of professional experience in veterinary clinicians [9] and with longer years of university education in students attending medical [42,43] and veterinary [44] faculties. The results of the present study were in agreement with these literature. Compassion is described as not being indifferent to the misfortunes of others, sympathizing with their sufferings, and wanting to help them, whilst the necessity and excessiveness of this state are referred to as "compassion

fatigue" [45]. Reports indicate that compassion fatigue may be observed over time, particularly in health workers over time [46], and may result in the loss of empathy [47]. Hence, it has been reported that veterinarians [48,49] and veterinary technicians [46] are prone to compassion fatigue. In a study on veterinary students, it was determined that students with a work history at a veterinary clinic suffered from a high level of compassion fatigue [50]. Therefore, in the present study, the decrease in empathy capacity observed with a longer career as a veterinary clinician suggests that the clinicians may have developed compassion fatigue over time. However, further, detailed studies are required to fully elucidate this issue.

In summary, the collective assessment of the study data demonstrated that the social problem-solving skills of veterinary clinicians were negatively affected by emotional empathy capacity, but positively affected by cognitive empathy capacity. Thus, it is suggested that the improvement of cognitive empathy capacity could improve social problem-solving skills. For this purpose, either lectures on cognitive empathy could be included in the curricula of veterinary faculties or faculty graduates could attend vocational training courses on cognitive empathy.

Availability of Data and Materials

The data supporting this study's findings are available from the corresponding author (S. Çavuş Alan) upon reasonable request.

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Competing Interests

The authors declared that there is no conflict of interest.

Ethical Statement

This study was approved by Fırat University Social and Human Sciences Research Ethics Committee (Approval no: 06/24-07.04.2022).

Author Contributions

Conception and design: RÖ, SÇA, AÖ. Data collection, analysis and interpretation: RÖ, SÇA, AÖ. Writing: RÖ and SÇA. Reviewing and editing: RÖ, SÇA, AÖ. All authors provided critical feedback and helped shape the research, analysis and manuscript.

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