



Satisfaction of dairy farmers towards attributes of services rendered by privately practicing para-vets at farmers' doorstep in different states of India

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ABSTRACT

A study was conducted in 2021 to measure the level of satisfaction of farmers towards para-veterinary services in four districts of India, namely Mathura, Hisar, Jaipur, and Ahmadnagar of Uttar Pradesh, Haryana, Rajasthan, and Maharashtra, respectively, using an exclusive 5-point Likert type scale. A total of 160 dairy farmers were surveyed under the random sampling method of investigation. In this study, ordered logistic regression was used to determine the predictors of satisfaction towards the delivery of animal health services to farmers. When the cause-effect relationship was analyzed, it was found that education, herd size, and annual income were negatively associated with satisfaction towards para-veterinary services. Comparative analysis of weighted mean scores for satisfaction revealed that dairy farmers were moderately satisfied with para-veterinary services in dimensions of behavioural aspects and, the cost of rendered service. When overall satisfaction of farmers towards para-veterinary services was analyzed, it was found that 44.38% of farmers were highly satisfied (having scale value of 0.42 and above on 0 to 1 point scale), followed by 32.50% respondents having a moderate level of satisfaction (value of 0.29-0.41). Para-vets need to put more effort in satisfying farmers *vis-à-vis* roles associated with extension and advisory services and, animal welfare aspects. Quality of service is the major factor affecting the satisfaction of the clientele. Thus, assessing the satisfaction of farmers towards para-veterinary services could be helpful in delivery of competent and efficient minor veterinary services at farmer's door-step.

Keywords: Dairy farmers, Likert-type scale, Ordered logistic regression, Para-veterinary services, Satisfaction

Satisfaction or dissatisfaction subjectively refers to the client's judgment on attributes of service in all its aspect (Uzir *et al.* 2020). As there exists manpower shortage for veterinarians and para-vets, para-veterinary services need to be competent and in turn, accountable towards responsibility delegated to them under minor-veterinary services (Kumar and Meena 2021). For assessing the satisfaction of livestock farmers towards animal husbandry services provided by various service providers, dimensions such as accessibility, availability of services, charge of services, effectiveness, efficiency, quality of services, to meet the expectation of farmers need to be assessed (Turkson 2011). A study in Tamil Nadu state revealed that farmers were highly satisfied with home service rendered by para-vets (0.83), followed by the private veterinary clinic (0.75) and public veterinary services (0.74) (Kathivaran *et al.* 2011). Studies indicated that the performance of para-vets in production services such as artificial insemination, pregnancy diagnosis has been found satisfactory, however, stakeholders revealed that there exists low satisfaction and

need for improvement in the role performance of para-vets for fodder development and use of locally available medicines (Thapa 2020). Distance travelled by farmers to reach dispensaries and in turn, the time taken by para-vets to reach them were also the determinants for varying satisfaction of farmers towards para-veterinary services (Turkson 2009). The overall level of satisfaction of farmers towards utilization of animal husbandry and healthcare services were highest for veterinarians, medium for para-vets, and lowest for 'over the counter' pharmacists (Vudriko 2021). Quality attributes such as reliability of treatment, frequent information about the outbreak of disease, and roles performed by para-vets such as artificial insemination, vaccination, deworming awareness campaign and post-mortem of dead animal affect the level of satisfaction of farmers towards para-veterinary services (Chand *et al.* 2014). It stands for utmost importance that fulfillment of farmer's demand should be done in a timely and cost-effective manner *vis-à-vis* effective delivery of animal health services (Enahoro 2021).

Therefore, present study was designed to validate the above attributes of services rendered by privately practicing para-vets and measure the satisfaction of farmers towards animal husbandry services, as established in earlier studies in the environment of job operation and clientele feedback

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towards these services.

MATERIALS AND METHODS

Sampling: The study was conducted in four different states of different agro-climatic zones of India in 2021. A total of four districts were selected from each of the respective states, Jaipur district of Rajasthan (western dry region), Mathura district of Uttar Pradesh (South-Western plains), Ahmadnagar district of Maharashtra (Western Plateau and Hills region), and Hisar district of Haryana (Trans-Gangetic plains region). The selection criteria of states were highest livestock population, the number of para-vet schools, and rank in milk production among various states of India. The selection of district was based on the highest number of para-vet schools compared to other districts of the state. Para-vets and trainers were selected as respondents based on a random sampling technique. The selection criteria of para-vets were: those who had undergone at least 1-month training for minor veterinary services, delivered minor veterinary services at farmer's doorstep for at least 2 years under the guidance of veterinarians on payment basis, and should not be working under the umbrella of any NGOs (such as J& K Trust, BAIF, etc.). Those trainers who were working in para-vet schools and possessed at least one year of experience at the time of investigation were selected as respondents.

Likert-type satisfaction scale: An exclusive Likert-type scale was developed to measure the level of satisfaction of farmers towards para-veterinary services, for which the PCA (Principal Component Analysis) method was used. An exhaustive list of statements was subjected to relevancy weightage and mean relevancy test. Then, these statements were administered to 80 dairy farmers of non-sample villages. Respondents were requested to give their response on a five-point continuum ranging from 'highly satisfied' to 'not highly unsatisfied'. Thereafter, Principal Component Analysis (PCA) was run for the final selection of statements and to get their weightage using SPSS (2013) software.

Dimensions for the satisfaction scale were formed after clubbing of variables representing similar attributes. A total of four dimensions were finalized, as they represented a cumulative of 79.50% of squared loadings (Eigenvalues). During the process of factor analysis using PCA, in the first run-five statements, and in the second run-six statements were dropped from the scale (Supplementary Table 1). In the third run of PCA, all the remaining 30 statements out of 41 were selected for the construction of scale as their communality values were above the cut-off (0.75) point. It constituted a total of 30 statements for the construction of scale to measure the level of farmer's satisfaction towards the para-veterinary services delivered to them.

Calculated Cronbach alpha was found to be 0.810 for the developed scale, which represented high-reliability statistics. Kaiser-Meyer-Olkin's measure of sampling adequacy for the scale was also found satisfactory (0.783). Finally, the scale was administered to the respondents of the

study area, for which responses were elicited on a five-point continuum (very high, high, moderate, low, and very low).

Ordered logistic regression analysis (OLR): This method was used to estimate the relationship between the dependent variable (level of satisfaction in ordered response category) and the independent variable either in the categorical, interval, or ratio scale (Supplementary Table 2). When the response categories have a natural ordering, the model specification should take that into account so that the extra information is utilized in the model. For carrying out this analysis, SAS 9.1.3 (2014) software was used. The satisfaction scale was taken as the dependent variable which has multiple levels (Low=1, Medium=2, High=3). The OLR function is given below.

$$Y^* = \beta_0 + \beta X' + \varepsilon$$

Where, β_0 , y intercept; β , slope of the line and ε , random error; Y^* , Satisfaction towards para-veterinary services (Low, Medium, and High adopter group); X' , Variables influencing the level of satisfaction of farmers, i.e. X_1 , X_2 , X_3 , X_4 , X_5 , X_6 , and X_7 , etc.; X_1 , Age of the farmer; X_2 , Education of the farmer; X_3 , Experience in dairy farming; X_4 , Herd size; X_5 , Land holding; X_6 , Annual income; and X_7 , Distance from veterinary clinic.

RESULTS AND DISCUSSION

Satisfaction of farmers towards various attributes of role and services performed by para-vets: In a study conducted by Turkson (2009), an attempt was made to identify and validate the various indicators affecting the level of satisfaction of farmers towards para-veterinary services. A similar effort was done in the present study to elicit wide responses of dairy farmers towards animal husbandry services rendered to them by para-vets. About 60% of farmers rated their satisfaction towards accessibility of para-veterinary services as high to very high because doorstep services were delivered on farmer's call. About 40% of respondents revealed a low to very low level of satisfaction towards the effectiveness of para-veterinary services to cure disease and reduce the mortality rate. The majority (80%) of para-vets gave equal priority to all categories of farmers irrespective of socio-economic conditions, so the level of satisfaction ranged from moderate to high on a five-point continuum (Table 1). A study conducted in Uttar Pradesh revealed that about 47% of livestock farmers had low faith, 28.67% have medium and 28.27 farmers have high faith in para-veterinary professionals (Hamdani 2013). Similar to the present study, 20% of farmers revealed a low to very low level of satisfaction towards accessibility, because in peak seasons of vaccination and deworming, the accessibility was not prompt due to an increase in workload. Delivery of minor-veterinary services through cooperatives was found in the Ahmadnagar district of Maharashtra. Under such conditions, delivery of animal husbandry services by dairy cooperatives could be highly prospective because it would be very effective to overcome barriers related to access of services, availability, and utilization and services for small-holder dairy farmers (Nishi *et al.* 2011, Rathod *et al.* 2011,).

Table 1. Distribution of overall respondents based on the geometric mean of attributes of roles and services performed by para-vets

Attribute of roles and services	Level of satisfaction				
	Very high	High	Moderate	Low	Very low
<i>Efficient utilization of services</i>					
Accessibility to obtain animal health services through para-vets	48 (30.00)	48 (30.00)	31 (19.38)	19 (11.88)	14 (08.75)
Effectiveness of services to reduce disease and mortality rate	27 (16.88)	38 (23.75)	46 (28.75)	31 (19.38)	18 (11.25)
Efficiency of para-vets to utilize the disease testing, sampling, and services of veterinarians whenever needed	18 (11.25)	24 (15.00)	33 (20.63)	47 (29.38)	38 (23.75)
Equal priority to all category of farmers irrespective of socio-economic conditions	46 (28.75)	51 (31.88)	30 (18.75)	20 (12.50)	14 (08.75)
Able to satisfy the client needs and expectation through service quality	27 (16.88)	37 (23.13)	38 (23.75)	33 (20.63)	25 (15.63)
Empathetic and helping in nature with a caring attitude	44 (27.50)	48 (30.00)	33 (20.63)	21 (13.13)	14 (08.75)
<i>Cost of service provided</i>					
On-time service delivery to the cost of delay and suffering	41 (25.63)	54 (33.75)	30 (18.75)	18 (11.25)	17 (10.63)
Carry and prescribe drugs easily obtainable from the drug store	25 (15.63)	32 (20.00)	39 (24.38)	36 (22.50)	28 (17.50)
Affordability to pay for services delivered	29 (18.13)	39 (24.38)	33 (20.63)	34 (21.25)	25 (15.63)
Availability of vaccines as per government vaccination programmes and schedule time of vaccination doses	35 (21.88)	40 (25.00)	33 (20.63)	30 (18.75)	22 (13.75)
Justifiable charge for the rendered services	37 (23.13)	41 (25.63)	35 (21.88)	27 (16.88)	20 (12.50)
Generic drugs and cost of drugs in terms of economic affordability	36 (22.50)	45 (28.13)	36 (22.50)	27 (16.88)	18 (11.25)
<i>Behavioural aspects</i>					
Nursing care and conduct towards animals with proper recognition of behaviour during AI, PD, and minor surgical treatments	23 (14.38)	32 (20.00)	38 (23.75)	37 (23.13)	30 (18.75)
Having warm relation with farmers	45 (28.13)	49 (30.63)	35 (21.88)	18 (11.25)	15 (09.38)
Resolve animal health problems and meet the need of farmers for desired services	24 (15.00)	32 (20.00)	37 (23.13)	36 (22.50)	31 (19.38)
Perceived needs, feasibility, and behavioural actions, in turn, met by counseling	22 (13.75)	33 (20.63)	38 (23.75)	37 (23.13)	30 (18.75)
<i>Avoidance of inappropriate/ ill practices</i>					
Avoid willfully administering any injurious drug or substance due to low cost	44 (27.50)	50 (31.25)	30 (18.75)	21 (13.13)	15 (09.38)
Not going for mutilating or killing by using strychnine injections in the heart or any other unnecessarily cruel manner	63 (39.38)	49 (30.63)	28 (17.50)	13 (08.13)	7 (04.38)
Don't prefer the injection of oxytocin to their milch animals to induce milk, which is injurious to health	34 (21.25)	42 (26.25)	36 (22.50)	28 (17.50)	20 (12.50)
Strictly avoid undesirable physiological practices	32 (20.00)	34 (21.25)	39 (24.38)	32 (20.00)	23 (14.38)
Avoid inhumane slaughtering in case of non-curable disease and economic unproductivity	43 (26.88)	51 (31.88)	33 (20.63)	19 (11.88)	14 (08.75)
Avoid giving antibiotics especially fourth generation and broad-spectrum ones	22 (13.75)	32 (20.00)	41 (25.63)	36 (22.50)	29 (18.13)
<i>Extension and advisory services</i>					
Participation in vaccination campaigns	17 (10.63)	25 (15.63)	36 (22.50)	48 (30.00)	34 (21.25)
Help in organizing field days and demonstrations	16 (10.00)	26 (16.25)	35 (21.88)	50 (31.25)	33 (20.63)
Consultancy services on animal husbandry practices	22 (13.75)	27 (16.88)	39 (24.38)	42 (26.25)	30 (18.75)
Surveillance to general notifiable diseases	11 (06.88)	16 (10.00)	26 (16.25)	59 (36.88)	48 (30.00)
Extension role in awareness campaigns and disease outbreak	18 (11.25)	24 (15.00)	32 (20.00)	47 (29.38)	39 (24.38)
<i>Animal welfare aspects</i>					
Avoid pain and injury during disease treatment	18 (11.25)	21 (13.13)	32 (20.00)	47 (29.38)	42 (26.25)
Avoid fear and distress to the animal during disease treatment	19 (11.88)	21 (13.13)	35 (21.88)	45 (28.13)	40 (25.00)
Consider animals to express normal behaviour at execution of para-veterinary services	15 (09.38)	23 (14.38)	33 (20.63)	49 (30.63)	40 (25.00)
Prevention of disease or rapid diagnosis and treatment	15 (09.38)	21 (13.13)	33 (20.63)	50 (31.25)	41 (25.63)
Ensured conditions and treatment which avoid mental suffering	13 (08.13)	20 (12.50)	33 (20.63)	50 (31.25)	44 (27.50)

Note: Figures in parenthesis indicate percentage.

Hence, dairy cooperatives and private integrators need to make enormous efforts to improve the health service delivery to reach the farmers (Karthikeyan *et al.* 2018).

Among the behavioural aspects, about half of the farmers had a moderate to low level of satisfaction for nursing care and conduct towards animals with proper recognition of behaviour during AI, PD, and minor surgical treatments, resolving animal health problems, and fulfilling the need of farmers for quality services. Under extension and outreach efforts, more than 50% of respondents perceived moderate to low level of satisfaction towards the participation of para-vets in vaccination campaign, organization of field day and demonstration, and their role in providing ground-level data to veterinarians in surveillance to general notifiable diseases (Table 1). About 40% of respondents revealed low to very low level of satisfaction towards the effectiveness of para-veterinary services to cure disease and reduce mortality rate because para-vets in most of the cases prioritize monetary remuneration of service, they cross their boundary of operation and try to cure disease by hit and trial method (Table 3). This finding was also supported by Venkatramaiah and Ahuja (2008) who highlighted that para-vets often go beyond their boundary of performing minor-veterinary services and perform those services for which they were not equipped or trained. Among the extension and advisory services, a low to very low level of satisfaction was found for surveillance to general notifiable diseases, and extension role in awareness campaigns and disease outbreak by 60.88 and 53.76% of respondents respectively, for which para-vets did not perform their role actively.

Comparison of level of satisfaction of farmers towards para-veterinary services in different districts: The weighted mean score for the satisfaction of farmers towards various attributes of para-veterinary services was worked out to compare the level of satisfaction of farmers towards para-veterinary service (PVS) in different districts (Table 2). It was found that under the efficient utilization of services attribute, a high level of satisfaction was found for accessibility to obtain the animal health services through para-vets, equal priority to all category of farmers irrespective of socio-economic conditions and empathetic and helping in nature with caring attitude, with a maximum weighted mean score of 10.27, 9.53 and 9.87 respectively in Hisar district, followed by 9.40, 9.67 and 9.27 in Jaipur district and least in Mathura district. Among the behavioural aspects attribute, it was found that accessibility to obtain the animal health services through para-vets, resolving animal health problems and meet the need of farmers for desired services, and nursing care and conduct towards animals with proper recognition of behaviour during AI, PD, and minor surgical treatments ranked first, second and third rank respectively (Table 2). Not preferring the injection of oxytocin to milch animals to induce milk, avoiding giving antibiotics especially fourth generation and broad-spectrum ones, and strict avoidance for undesirable physiological practices ranked fourth, fifth and sixth respectively. The weighted mean scores for roles of para-vets under efficient utilization of services attribute were found high in Hisar district, followed by Jaipur, and least in Mathura district.

Towards the avoidance of ill/ inappropriate practices,

Table 2. Weighted mean for the level of satisfaction of farmers towards various services rendered by para-vets in different districts

Attribute of roles and services	Weighted mean for the level of satisfaction				Overall	Rank
	Mathura	Hisar	Jaipur	Ahmadnagar		
<i>Efficient utilization of services</i>						
Accessibility to obtain animal health services through para-vets	9.00	10.27	9.40	8.73	38.46	2
Effectiveness of services to cure disease and reduce the mortality rate	7.93	8.07	7.93	8.20	33.66	4
Efficiency of para-vets to utilize the disease testing, sampling, and services of veterinarians whenever needed	6.53	7.20	7.07	7.00	27.80	6
Equal priority to all category of farmers irrespective of socio-economic conditions	9.53	9.53	9.67	9.80	38.53	1
Able to satisfy the client needs and expectation through service quality	7.80	7.80	8.47	8.47	32.53	5
Empathetic and helping in nature with a caring attitude	8.93	9.87	9.27	10.07	37.80	3
<i>Cost of service provided</i>						
On-time service delivery to the cost of delay and suffering	8.80	9.67	10.00	9.20	37.60	1
Carry and suggest drugs easily obtainable from the drug store	7.40	8.27	7.80	7.93	31.33	6
Affordability to pay for services delivered	8.93	9.93	6.80	7.20	32.86	5
Availability of vaccines as per government vaccination programmes and schedule time of vaccination doses	7.80	7.27	10.33	9.67	34.40	4
Justifiable charge for the rendered services	9.13	9.27	8.80	8.00	35.20	3
Generic drugs and cost of drugs in terms of economic affordability	8.13	8.20	10.33	9.00	36.00	2

Contd...

Table 2 Continued.

Attribute of roles and services	Weighted mean for the level of satisfaction				Overall	Rank
	Mathura	Hisar	Jaipur	Ahmadnagar		
<i>Behavioural aspects</i>						
Nursing care and conduct towards animals with proper recognition of behaviour during AI, PD, and minor surgical treatments	7.53	7.93	7.47	7.80	30.73	3
Having warm relation with farmers	8.67	9.60	9.93	10.27	38.46	1
Resolve animal health problems to meet the need of farmers for desired services	8.00	7.27	7.93	7.60	30.80	2
Perceived needs, feasibility, and behavioural actions, in turn, met by counseling	7.47	7.80	7.93	7.47	30.66	4
<i>Avoidance of inappropriate/ ill practices</i>						
Avoid willfully administering any injurious drug or substance due to low cost	10.33	9.13	9.20	9.13	37.80	3
Not going for mutilating or killing by using strychnine injections in the heart or any other unnecessarily cruel manner	10.67	10.20	10.60	10.40	41.86	1
Don't prefer the injection of oxytocin to their milch animals to induce milk, which is injurious to health	8.60	9.60	9.07	8.40	34.80	4
Strictly avoid undesirable physiological practices	7.93	9.20	8.60	7.60	33.33	6
Avoid inhumane slaughtering for non-curable and unproductive animals	10.07	9.47	8.73	9.87	38.00	2
Avoid giving antibiotics especially fourth generation and broad-spectrum ones	8.93	7.80	7.80	7.47	30.80	5
<i>Extension and advisory services</i>						
Active participation in vaccination campaigns	7.00	7.27	7.60	6.47	28.20	2
Role in demonstrations and visiting with veterinarians	7.07	7.20	7.73	6.13	28.13	3
Consultancy services on common husbandry practices	7.67	7.33	7.53	7.40	29.93	1
Surveillance to general notifiable diseases	6.53	6.07	5.47	5.93	24.20	5
Extension role in awareness campaigns and disease outbreak	7.27	6.93	6.87	6.60	27.66	4
<i>Animal welfare aspects</i>						
Avoid pain and injury during disease treatment	6.53	7.07	6.60	7.00	27.06	2
Avoid fear and distress to the animal during disease treatment	6.87	7.07	7.07	6.93	27.60	1
Consider animals to express normal behaviour at execution of para-veterinary services	7.13	6.33	6.73	7.13	26.93	3
Prevention of disease or rapid diagnosis and treatment	6.47	6.20	7.27	6.67	26.60	4
Ensured conditions and treatment which avoid mental suffering	6.87	6.20	6.53	6.80	25.86	5

not going for mutilating or killing by using strychnine injections in the heart or any other unnecessarily cruel manner, avoidance of inhumane slaughtering in case of non-curable disease and economic unproductivity, and willfully avoiding to administer any injurious drug or substance due to low cost with a geometric mean score of 41.86, 38.00 and 37.80 respectively, received overall first, second and third rank with very less variability in geometric mean scores among the districts. Para-vets did not focus on animal behaviour and nursing conduct because they were not aware of its importance and they render their service and charge money (Table 2). Among extension and advisory services, consultancy services on animal husbandry practices received top most rank, followed by participation in vaccination campaigns. The findings of the study agreed with the reports of Chaturvedani *et al.* (2016)

who revealed that towards the animal husbandry consultancy services, more than 30% of farmers were very satisfied in the Bilaspur district of Chhattisgarh.

Categorization of respondents according to scores obtained on the satisfaction scale: It was found that about 22.50% of respondents belonged to highly satisfied (having scale value of 0.52 and above), followed by 44.38% respondents having a moderate level of satisfaction (0.29-0.41 score on 0 to 1 point continuum scale) towards para-veterinary services. About 33.12% of respondents had a low level of satisfaction towards para-veterinary services rendered to them. The finding of the study aligned with the reporting of Chaturvedani *et al.* (2016), who conducted a study on the delivery of animal health services in India and revealed that the majority of farmers had a low to moderate level of satisfaction towards animal health

Table 3. Determinants of satisfaction towards minor veterinary services (ordered logistic regression model)

Explanatory variable	Coefficient	P-value	Marginal effects
Age of farmers	.2227176	0.007	0.0098
Level of education of farmers	-.3161002	0.499	-0.1149
Experience in dairying	3.108267	0.002	0.0732
Herd size	-1.010921	0.001	-0.1551
Land holding (in ha)	-1.000834	0.652	-0.0470
Distance from veterinary hospital	1.981598	0.001	0.1172
Annual income (Log ₁₀)	-8.378885	0.024	-0.1052

services rendered to them. In-time availability of services and increased coverage at farmer's doorstep need to gain better productivity.

Relationship between the satisfaction of farmers towards para-veterinary services and their socio-economic profile:

The present study used the ordered logistic regression to examine the relationship between satisfaction towards para-veterinary services and socio-economic variables of the farmers. For the model, satisfaction as response variables were classified into low, medium, and high levels of satisfaction. For education, herd size, annual income, and distance from the veterinary clinic, the P-value was less than 0.05 which signifies that these four variables out of seven were significant (Table 3). If a dairy farmer has to increase his level of education by one point, his ordered log-odds of being in a higher satisfaction level category would decrease by 11.49% (if other variables were kept constant in the regression model). Similarly, if a farmer has to increase his herd size score by one point, his ordered log-odds of being in a higher level of satisfaction category would decrease by 15.51% (if other variables were kept constant in the regression model). If the farmer has to increase his annual income score by one point, his ordered log-odds of being in a higher satisfaction

level category would decrease by 10.52%. Likewise, if the distance from veterinary clinic score increases by one point, his ordered log-odds of being in a higher satisfaction level category would increase by 11.72% and this finding was in alignment with report of Bardhan *et al.* (2015), who revealed that with an increase in distance from veterinary hospitals, farmers' preference for animal health service providers shifted from government veterinarians to private veterinarians and para-vets. Experience in dairy farming (in years) and landholding (in ha) were the socio-economic variables found non-significant in the ordered logistic regression model.

A study conducted by Jain *et al.* (2016) in Rajasthan state revealed that farmers have to wait a long time for public veterinary centers (0.93), and private veterinary clinic (0.83), while it was very short for availing para-veterinary services. Thus, we can infer that a short waiting time for services rendered by para-vets increased the level of satisfaction of farmers towards the service rendered by them. The findings of the study aligned with report of Rewani *et al.* (2019), who conducted a study in the Jaipur district of Rajasthan, delineated the constraints perceived by farmers affecting the level of satisfaction towards para-veterinary services. Those constraints were the high cost of service by veterinarians (62.50%), irregular availability of on-time and emergency services at the doorstep (54.16%), large distance to veterinary hospital/polyclinic (43.33%), inaccessibility of veterinarians or para-vets (37.50%), inadequate training and extension services (35%) and lack of advisory services related to animal husbandry and management (33.33%).

Satisfaction of farmers towards awareness to control non-desirable practices performed by para-vets: The results indicated that nearly 40% of farmers revealed low to very low levels of satisfaction towards all these practices (Table 4). Only 28.75% of farmers fall in the category of satisfied to highly satisfied for reducing the overuse of antibiotics especially 4th generation and oxytetracycline, followed

Table 4. Distribution of respondents according to the level of satisfaction towards awareness to control unethical practices performed by para-vets (n=160)

Practices performed by para-vets	Highly Satisfied	Satisfied	Moderate	Unsatisfied	Highly unsatisfied	Weighted mean	Rank
Avoiding irrational and overuse of antibiotics especially 4 th gen and oxytetracycline	21 (13.12)	25 (15.63)	34 (21.50)	41 (25.62)	39 (24.37)	28.53	5
Optimum dose of parasitic drugs (e.g. More than 60 mg/kg of body weight)	26 (16.25)	28 (17.50)	35 (21.87)	33 (20.63)	38 (23.75)	30.07	2
Less use of painkillers (e.g. Banned drug Diclofenac)	28 (17.50)	29 (18.12)	32 (20.00)	36 (22.50)	35 (21.87)	30.60	1
Less use of oxytocin injections	24 (15.00)	27 (16.88)	29 (18.12)	41 (25.62)	39 (24.38)	29.07	4
Avoiding excessive feeding of calcium	24 (15.00)	30 (18.75)	31 (19.38)	36 (22.50)	39 (24.37)	29.60	3
Not going for use of kit for milking of non-milch animals (Recombinant bovine growth hormone + Corticosteroid + Growth hormone)*	02 (06.45)	02 (06.45)	06 (19.35)	11 (35.48)	10 (32.25)	6.33	7
Recognize the health status of animal before performing AI at farmer's door-step	21 (13.12)	24 (15.00)	29 (18.13)	39 (24.37)	47 (29.38)	27.53	6

Note: *Practice availed by 31 respondents only; figures in parenthesis indicate percentage.

by 21.50% respondents who were moderately satisfied. Para-vets used these drugs because broad-spectrum and 4th generation antibiotics have wider use for various numbers of diseases in the advanced stage where initial generation antibiotics didn't work. About 45% of respondents were having various degrees of unsatisfaction due to overuse of painkillers (e.g. banned drug Diclofenac), but 55.62% of farmers were having a moderate to a high level of satisfaction towards it. Farmers were highly satisfied by less use of painkillers and optimum dose of parasitic drugs (e.g. more than 60 mg/kg of body weight), which received the geometric mean score of 30.60 and 30.07 respectively. Very few farmers preferred (total 31 farmers) to opt for the use of the kit for milking of non-milch animals (Recombinant Bovine Growth Hormone + Corticosteroid + Growth hormone). It was found that 12.90% of farmers expressed a high to a very high level of satisfaction towards it. However, farmers were least satisfied with recognition of the health status of the animal before performing AI at the farmer's doorstep by para-vets.

An exclusive 5-point Likert Scale was constructed to delineate the satisfaction of farmers towards para-veterinary services, for which high validity and reliability were ensured. The para-veterinary services were analysed for cost of services, efficient utilization of services, behavioural compatibility, avoidance of ill practices, extension services, and animal welfare aspects. It was found that behavioural aspects, cost of services, avoidance of ill/inappropriate services were the thrust areas which need improvements. Comparative analysis of weighted mean scores for satisfaction revealed that dairy farmers were satisfied with para-veterinary services in terms of behavioural aspects and the cost of service. When cause-effect relationships were analysed, it was found that education, herd size, and annual income were negatively associated with satisfaction towards para-veterinary services. Para-veterinary services were found highly satisfiable in terms of equal priority to all categories of farmers irrespective of socio-economic conditions, on-time service delivery, having warm relation with farmers, and consultancy services on common husbandry practices. Para-vets need more effort in satisfying farmers towards roles associated with extension and advisory services and consideration of animal welfare aspects. However, investigators found that farmers were not very efficient in judging the para-veterinary services *vis-à-vis* avoidance of inappropriate/ill practices and animal welfare aspects because most of them were smallholder dairy farmers, and had small herd size which violates animal welfare aspects in common practice.

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