

Print ISSN : 0972-8813
e-ISSN : 2582-2780

[Vol. 19(2), May-August, 2021]

Pantnagar Journal of Research

(Formerly International Journal of Basic and
Applied Agricultural Research ISSN : 2349-8765)



G.B. Pant University of Agriculture & Technology, Pantnagar



ADVISORYBOARD

Patron

Dr. Tej Partap, Vice-Chancellor, G.B. Pant University of Agriculture and Technology, Pantnagar, India

Members

Dr. A.S. Nain, Ph.D., Director Research, G.B. Pant University of Agri. & Tech., Pantnagar, India
Dr. A.K. Sharma, Ph.D., Director, Extension Education, G.B. Pant University of Agri. & Tech., Pantnagar, India
Dr. S.K. Kashyap, Ph.D., Dean, College of Agriculture, G.B. Pant University of Agri. & Tech., Pantnagar, India
Dr. N.S. Jadon, Ph.D., Dean, College of Veterinary & Animal Sciences, G.B. Pant University of Agri. & Tech., Pantnagar, India
Dr. K.P. Raverkar, Ph.D., Dean, College of Post Graduate Studies, G.B. Pant University of Agri. & Tech., Pantnagar, India
Dr. Sandeep Arora, Ph.D., Dean, College of Basic Sciences & Humanities, G.B. Pant University of Agri. & Tech., Pantnagar, India
Dr. Alaknanda Ashok, Ph.D., Dean, College of Technology, G.B. Pant University of Agri. & Tech., Pantnagar, India
Dr. Alka Goel, Ph.D., Dean, College of Home Science, G.B. Pant University of Agri. & Tech., Pantnagar, India
Dr. R.S. Chauhan, Ph.D., Dean, College of Fisheries, G.B. Pant University of Agri. & Tech., Pantnagar, India
Dr. R.S. Jadaun, Ph.D., Dean, College of Agribusiness Management, G.B. Pant University of Agri. & Tech., Pantnagar, India

EDITORIALBOARD

Members

Prof. A.K. Misra, Ph.D., Chairman, Agricultural Scientists Recruitment Board, Krishi Anusandhan Bhavan I, New Delhi, India
Dr. Anand Shukla, Director, Reefberry Foodex Pvt. Ltd., Veraval, Gujarat, India
Dr. Anil Kumar, Ph.D., Director, Education, Rani Lakshmi Bai Central Agricultural University, Jhansi, India
Dr. Ashok K. Mishra, Ph.D., Kemper and Ethel Marley Foundation Chair, W P Carey Business School, Arizona State University, U.S.A
Dr. B.B. Singh, Ph.D., Visiting Professor and Senior Fellow, Dept. of Soil and Crop Sciences and Borlaug Institute for International Agriculture, Texas A&M University, U.S.A.
Prof. Binod Kumar Kanaujia, Ph.D., Professor, School of Computational and Integrative Sciences, Jawahar Lal Nehru University, New Delhi, India
Dr. D. Ratna Kumari, Ph.D., Associate Dean, College of Community / Home Science, PJTSAU, Hyderabad, India
Dr. Deepak Pant, Ph.D., Separation and Conversion Technology, Flemish Institute for Technological Research (VITO), Belgium
Dr. Desirazu N. Rao, Ph.D., Professor, Department of Biochemistry, Indian Institute of Science, Bangalore, India
Dr. G.K. Garg, Ph.D., Dean (Retired), College of Basic Sciences & Humanities, G.B. Pant University of Agric. & Tech., Pantnagar, India
Dr. Humnath Bhandari, Ph.D., IRRI Representative for Bangladesh, Agricultural Economist, Agrifood Policy Platform, Philippines
Dr. Indu S Sawant, Ph.D., Director, ICAR - National Research Centre for Grapes, Pune, India
Dr. Kuldeep Singh, Ph.D., Director, ICAR - National Bureau of Plant Genetic Resources, New Delhi, India
Dr. M.P. Pandey, Ph.D., Ex. Vice Chancellor, BAU, Ranchi & IGKV, Raipur and Director General, IAT, Allahabad, India
Dr. Martin Mortimer, Ph.D., Professor, The Centre of Excellence for Sustainable Food Systems, University of Liverpool, United Kingdom
Dr. Muneshwar Singh, Ph.D., Project Coordinator AICRP- LTFE, ICAR - Indian Institute of Soil Science, Bhopal, India
Prof. Omkar, Ph.D., Professor, Department of Zoology, University of Lucknow, India
Dr. P.C. Srivastav, Ph.D., Professor, Department of Soil Science, G.B. Pant University of Agriculture and Technology, Pantnagar, India
Dr. Prashant Srivastava, Ph.D., Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, University of South Australia, Australia
Dr. Puneet Srivastava, Ph.D., Director, Water Resources Center, Butler-Cunningham Eminent Scholar, Professor, Biosystems Engineering, Auburn University, U.S.A.
Dr. R.C. Chaudhary, Ph.D., Chairman, Participatory Rural Development Foundation, Gorakhpur, India
Dr. R.K. Singh, Ph.D., Director & Vice Chancellor, ICAR-Indian Veterinary Research Institute, Izatnagar, U.P., India
Prof. Ramesh Kanwar, Ph.D., Charles F. Curtiss Distinguished Professor of Water Resources Engineering, Iowa State University, U.S.A.
Dr. S.N. Maurya, Ph.D., Professor (Retired), Department of Gynecology & Obstetrics, G.B. Pant University of Agric. & Tech., Pantnagar, India
Dr. Sham S. Goyal, Ph.D., Professor (Retired), Faculty of Agriculture and Environmental Sciences, University of California, Davis, U.S.A.
Prof. Umesh Varshney, Ph.D., Professor, Department of Microbiology and Cell Biology, Indian Institute of Science, Bangalore, India
Prof. V.D. Sharma, Ph.D., Dean Academics, SAI Group of Institutions, Dehradun, India
Dr. V.K. Singh, Ph.D., Head, Division of Agronomy, ICAR-Indian Agricultural Research Institute, New Delhi, India
Dr. Vijay P. Singh, Ph.D., Distinguished Professor, Caroline and William N. Lehrer Distinguished Chair in Water Engineering, Department of Biological Agricultural Engineering, Texas A&M University, U.S.A.
Dr. Vinay Mehrotra, Ph.D., President, Vinlax Canada Inc., Canada

Editor-in-Chief

Dr. Manoranjan Dutta, Head Crop Improvement Division (Retd.), National Bureau of Plant Genetic Resources, New Delhi, India

Managing Editor

Dr. S.N. Tiwari, Ph.D., Professor, Department of Entomology, G.B. Pant University of Agriculture and Technology, Pantnagar, India

Assistant Managing Editor

Dr. Jyotsna Yadav, Ph.D., Research Editor, Directorate of Research, G.B. Pant University of Agriculture and Technology, Pantnagar, India

Technical Manager

Dr. S.D. Samantray, Ph.D., Professor, Department of Computer Science and Engineering, G.B. Pant University of Agriculture and Technology, Pantnagar, India

CONTENTS

Identification of new source of white rust resistance in Indian mustard [<i>B. juncea</i> (L.) Czern & Coss] from germplasm collected from Uttarakhand hills	112
USHA PANT, RAM BHAJAN, PURNIMA KANDPAL, NEHA DAHIYA, A. K. SINGH and SAMEER CHATURVEDI	
Genetic variability studies for yield and its related traits in rice (<i>Oryza sativa</i> L.) genotypes	119
APARNA, INDRA DEO, CHARUPRIYA CHAUHAN and DEEPAYAN ROY	
Net photosynthesis and spectral reflectance over rice crop under different nitrogen treatments in semi-arid region of India	125
SHWETA POKHARIYAL and N.R. PATEL	
Management of crop with livestock and allied enterprises for sustainable livelihood of small farmers in north Indian plains	131
S. CHATURVEDI, R. SINGH, A. P. SINGH, D. K. SINGH and R. K. SHARMA	
Effect of mulches and irrigation schedules on productivity and water use efficiency of sunflower (<i>Helianthus annuus</i> L.) in Mollisols of India	137
RAKESH DAWAR and MAHENDRA SINGH PAL	
Growth and yield response of black gram (<i>Vigna mungo</i> L.) to foliar nutrition and growth regulator application	144
SUSHIL, OMVATI VERMA, SUBSHA CHANDRA, J.P.JAISWAL and V.C. DHYANI	
Effect of FYM and nitrogen levels on growth, dry matter accumulation, yield and nutrient uptake of brahmi (<i>Bacopa monnieri</i> L.)	151
VINEETA RATHORE	
Studies on flowering behaviour of double type varieties of African marigold (<i>Tagetes erecta</i> L.) in different seasons under Uttarakhand conditions	159
ANUBHAVIYA BISHT, V.K. RAO and D. C. DIMRI	
Effect of pyrolysis temperatures on major nutrients and some physical and chemical properties in biochar produced from different biosources	166
ABHISHEK SAXENA, P.C. SRIVASTAVA, ANAND PATHAK and S.P. PACHAURI	
Status of some extractable macro- and micro-nutrients in soils of Tehri Garhwal district of Uttarakhand	171
AASHISH PRAJAPATI, S. P. PACHAURI, P.C. SRIVASTAVA, ANAND PATHAK and DEEPA RAWAT	
Effect of Stabilized Magnetite Nano Fertilizer on growth, yield and nutrient contents of broccoli (<i>Brassica oleracea</i> var. <i>italica</i> L.) cv. F1 HYB NS-50	180
RAKESH JAT, SOHEB SHEKH, JINALI SHAH, PUJAN VAISHNAV and P. O. SURESH	
Effect of sixteen essential oils on the progeny production of <i>Sitophilus oryzae</i> (Linnaeus)	187
NIDHI TEWARI and S. N. TIWARI	
Bio-efficacy of some essential oils as fumigant against Lesser grain borer, <i>Rhyzopertha dominica</i> (Fab.)	195
NIDHI TEWARI and S. N. TIWARI	

Seasonal changes in yield, composition and fumigant action of essential oil of <i>Murraya koenigii</i> L. against <i>Rhyzopertha dominica</i>(F.) and <i>Sitophilus oryzae</i> (L.) GEETANJLY and S.N.TIWARI	204
Natural enemies of papaya mealybug, <i>Paracoccus marginatus</i> Williams and Granara de Willink in Tarai region of Uttarakhand RADHA KORANGA and R. P. MAURYA	214
Combined effect of entomopathogens with biorationals against Lepidopteran insect pests of greengram KULDEEP KUMAR DUDPURI and J. P. PURWAR	220
Seasonal abundance of predatory coccinellid beetles in different cropping ecosystems at Pantnagar R. NAVEENA MANIMALA, MEENA AGNIHOTRI and J.M. SAM RAJ	227
Diversity of insect pollinators and pollination mechanism in sponge gourd, <i>Luffa cylindrica</i> (L.) Roem MOHAMMAD SARFRAZ KHAN and GAURAVA KUMAR	232
Effect of host genotypes on the severity of sorghum anthracnose MEENAKSHI RANA, YOGENDRA SINGH, DIVAKAR and SEWETA SRIVASTAVA	238
A review on sugarcane smut caused by <i>Sporisorium citamineum</i> and its eco-friendly management SHAILBALA SHARMA	245
Significance of Nutritional Mapping in today's scenario DUTTA A., JOSHI D., BOSE S. and ACHARYA R.	256
Development and shelf-life evaluation of fiber enriched traditional Indian Parotta PAL MURUGAN MUTHAIAH, PRIYANKA, SANTOSH PAL, GOVINDA RAJ T, KHAN M.A., SHARMA G.K. and SEMWAL A.D.	264
To study the effect of maltodextrin, tricalcium phosphate, glycerol monostearate and drying temperature on vacuum foam mat quality parameters of papaya powder SACHIN KUMAR, ANIL KUMAR, P.K.OMRE, JITENDRA CHANDOLA and IFTIKHAR ALAM	277
Design and development of self-propelled onion (<i>Allium cepa</i> L.) digger VISHAL PATEL, DHARMENDRA KUMAR and ANSHU SAXENA	294
Lead toxicity in cattle: A case report NEERAJ KUMAR, MANISH KUMAR VERMA, MUNISH BATRA and ANKIT NAGAR	299
Bovine tropical theileriosis in cross-bred calf: A case report NEERAJ KUMAR, STUTI VATSYA, MUNISH BATRA, MANISH KUMAR VERMA and JIYA VERMA	303
Occupational hazards among veterinarians PARMAR, T., UPADHYAY A. K. and MAANSI	306
Epidemiological factors of COVID-19 POOJA SINGH, MAANSI, N. K. SINGH, and A. K.UPADHYAY	311
Effect of probiotics and growth stimulants on haematological status in Murrah buffalo SAMEER PANDEY, RAJ KUMAR, RAJBIR SINGH, DEEPAK KUMAR, KARTIK TOMAR and SHIWANSHU TIWARI	318
Effect of supplementation of black cumin (<i>Nigella sativa</i>) on growth performance and haematological parameters of commercial broilers NAMITA NAULA, C.B. SINGH, SHIWANSHU TIWARI and DEVESH SINGH	325

Occupational hazards among veterinarians

PARMAR, T., UPADHYAY A. K. and MAANSI

Department of Veterinary Public Health and Epidemiology, College of Veterinary and Animal Sciences, G. B. Pant University of Agriculture and Technology, Pantnagar-263145 (U.S. Nagar, Uttarakhand)

ABSTRACT: Veterinary professionals are always exposed to occupational risks like traumatic injuries, zoonotic diseases and mental health hazards. Physical injuries reported were bite (31.8%), scratch (65.1%), kick (62.8%), horn wound (14%), needle prick (89.2%), fracture (3.8%) and injuries due to falling/ lifting animals/ moving heavy equipment (61.3%). Majority of veterinarians experienced some form of allergy. Incidence of skin irritation was highest among 50.2% veterinarians. Ringworm (13.5%) and fungal infection (26.5%) were most common zoonotic infection. Low level stress was reported in 45% of participants, 34% had moderate and 21% felt high level of psychological stress. The proportion of participants using protective equipment includes 60% gloves, 1.1% goggles, and 39.8% apron. The study showed that 171(43.6%), 122 (31.1%), 67 (17.1%), 32 (8.2%) veterinarians followed deworming at 6 month, 1 year, 2 year and more than 2 year intervals respectively. The awareness levels concerning occupational hazards among the veterinary health professionals was near optimal but the need was felt to implement efforts aimed at addressing deterrence of occupational hazards.

Key words: Epidemiology, hazard, veterinarian, zoonotic

A veterinarian is a person who interacts with a range of animals and thus in process carries the greatest risk of occupational hazards (Epp and Waldner, 2012). This veterinary profession exposes veterinarians to various risks like traumatic injuries, zoonotic diseases transmitted by animals or by their parasites (Roberts, 1995), various hazardous chemicals and drugs, allergies caused by animal handling or by animal products, and mental stress (Hill *et al.*, 1998). Physical and mental illnesses or stress also serve as the potential risks to humans (Hill *et al.*, 1998; Fritts *et al.*, 2008). The hazards at animal welfare hospitals may outnumber those at human health workplace (Nienhaus *et al.*, 2005). Chemical hazards are resulting mainly due to use of antibiotics, pesticides, X-rays, prostaglandins, formaldehyde, chemotherapeutic agents and gaseous anesthetics (Jeyaretnam and Jones, 2000). The hazardous effect of chemicals such as chromium salts, nickel salts, acetamide and propanol used in veterinary practice include teratogenicity, corrosiveness, carcinogenicity, allergic reaction and lung damage (AVMA, 1990).

Biological risk is prevalent in all work activities where there is possibility of exposure to pathogenic microorganisms. Human brucellosis is major occupational hazard affecting dairy farmers, veterinarians, veterinary assistants and veterinary pharmacists (Yohannes and Gill, 2011). The main route of transmission of disease includes needle prick injuries while vaccinating female calves, and

contact with infected excretions and secretions of animals (Leggat *et al.*, 2009; Kutlu *et al.*, 2014). In addition to zoonotic diseases, veterinarians are also prone to develop allergies. The common allergens are amniotic fluids, vaginal secretions, latex gloves, and exposure to dander, parasites and blood proteins (Jeyaretnam and Jones, 2000). Lack of awareness regarding the hazards is leading more veterinarians at risk and in turn succumbing to various hazards. The risk factors once removed will prevent many veterinarians facing the hazards.

MATERIALS AND METHODS

The study design was a descriptive cross-sectional type. It occupied only qualitative and quantitative data collection methods. The data were collected by using a self-prepared questionnaire from Uttarakhand and some places of Uttar Pradesh and Punjab states. The period of study was August 2017 to February 2018. Data were collected through personal interview with veterinarians at their hospitals, by distributing questionnaire to government Veterinary officers during their monthly meetings and posted to various veterinary hospitals. The study population included field veterinarians of Uttarakhand state and academic veterinarians belonging to clinical departments of different institutions of Uttarakhand, Punjab and Uttar Pradesh states. The data collected from questionnaire were identified by numbers, coded numerically and entered into the MS Excel program

and percentage frequencies were calculated on 40 questions based on the demographics and occupational hazards and preventive measures taken. Occupational hazards were further categorized into physical hazards, radiation hazard, chemical hazards, zoonotic hazards and psychological hazards. Details of all these occupational hazards and preventive measures applied by veterinarians were categorized into different tables to present and evaluate information concerning different kind of attributes.

RESULTS AND DISCUSSION

Out of total 1000 questionnaire only 400 responses were achieved. Out of 400 responses, 8 were excluded from further analysis on account of incompletely filled response. Field veterinarians were prompt (61.8%) compared to veterinarians in academics (38.2%).

Physical injuries

Various studies on veterinary profession have revealed that veterinary work is physically challenging and poses a raised risk of severe injuries or trauma. Majority of veterinarians reported some sort of injuries within last five year. Out of total 392 respondents, 20 (5.1%) reported no injury, 186 (47.5%) respondents had 1-5 injuries, 126 (32.1%) encountered 5-10 injuries and 60 (15.3%) veterinarians had more than 10 injuries during last 5 years. From the analysis of survey, we can affirm that physical injuries remain one of the main risk factor for veterinarians as also observed by Bonini *et al.* (2016). Present study explain needle prick injuries are frequent in the veterinary (Table 1), this is found to be in alignment with the work of Fowler *et al.* (2016). Needle stick injuries may involve the risk of self-injecting drugs and other harmful substances and the primary method to diminish needle stick injuries is to keep away from recapping needles or at the very least use 'one handed scooping technique' to recap (Weese and Jack, 2008). Apart from needle prick injury, veterinarians were also

Table 2: Veterinarians using protective gears while taking x-rays

Attributes	Frequency	Percentage
Total no. of veterinarians taking x-ray	75	19.1% (75/392)
No. of veterinarians using lead gloves	46	61.3% (46/75)
No. of veterinarians using lead apron	65	86.7% (65/75)
No. of veterinarians using lead sleeves	7	9.3% (7/75)
No. of veterinarians using protective glasses	25	33.3% (25/75)
No. of veterinarians using personal monitor	38	50.6% (38/75)

Table 3: Veterinarians contracted various zoonotic diseases while dealing animals

Attributes	Frequency	Percentage
Ringworm	53	13.5%
Other fungal infections	104	26.5%
Scabies	20	5%
Toxoplasmosis	2	0.5%
Other parasitic infections	37	9.5%
Amoebiasis	20	5%
Tuberculosis	2	0.5%
Brucellosis	0	0%
Staphylococcosis	0	0%
Salmonellosis	0	0%
Influenza	78	19.8%

injured by bite, scratch, kick, horn wound, fracture and injuries due to falling while lifting or restraining animals (Table 1). The ergonomic injuries have been acknowledged as physical hazards with recurring task and manual handling burden through lifting and restraining animals contributing too many physical problems among veterinarians (Moore *et al.*, 1993).

Radiation hazards

The dose of radiation depends on the numbers of x-ray taken by the person, type of machine and setting, involvement of veterinarian in physical restraining of animals and protective devices used by the person (Shirangi *et al.*, 2007). The low proportion of veterinarians (19.1%), taking x-ray is not consistent with an Australian study where 79% practicing veterinarians used radiography as diagnostic tool (Shirangi *et al.*, 2007). The reason for this variance may be unavailability of x-ray machines in government veterinary hospitals in India

Table 1: Details of different kinds of physical injuries among veterinarians

S.N	Type of Injury	Veterinarian injured (Number-392)		Veterinarian took treatment for injuries	
		Frequency	Percentage	Frequency	Percentage
1	Animal bite	125	31.8%	120	96%
2	Scratch	255	65.1%	94	36.8%
3	Kick	246	62.8%	43	17.4%
4	Horn wound	55	14%	31	56.3%
5	Fracture	15	3.8%	15	100%
6	Needle prick	350	89.2%	28	8%
7	Injuries due to falling while lifting or restraining animals	241	61.3%	143	59.3%

especially Uttarakhand. The results regarding using protective gears by veterinarians while performing x-rays revealed that 86.7% were using lead apron but other protective gears like lead gloves, personal monitor, protective glasses and lead sleeves were not common (Table 2), this proportion is nearly similar to those reported by Jacobson and Farowe (1964).

Chemical Hazards

Veterinarians handle drugs, disinfectants, antiseptics, pesticides etc. (Shirangi *et al.*, 2007). Responses on chemical hazard linked sickness revealed that 187 (47.7%) veterinarians were using antineoplastic agents to treat animals and out of 187 individuals, 4 (2.1%) veterinarian accidentally injected drugs to themselves. None reported any adverse effect due to self-injection. Adverse effects of disinfectant were reported by 32 (8%) veterinarians. Adverse effects like headache, nausea, skin irritation etc. due to pesticides reported by 3 (0.7%) veterinarians. Allergy due to latex gloves causing itching, skin rashes, skin irritation was reported in 41 (10%) veterinarians. Chemical risk seems to be less pertinent than physical and biological risks but the threats from chemicals and drugs cannot be overlooked and the literature advocated the relevance of these threats (Fritschi, 2008).

Zoonotic hazards

Ringworm and other fungal infection are most common zoonotic infection among veterinarians (Table 3), Epp and Waldner, (2012) also reported similar result in their study among veterinarian of Western Canada. The Influenza virus was reported in 78 (19.8%) veterinarians (Table 3) but there is no report of influenza in veterinarian except for 11% seroprevalence of swine influenza virus among veterinary students (Woods *et al.*, 1981). Among bacterial zoonotic infection, tuberculosis was in 2 (0.5%) veterinarians but in a study conducted by Khattak *et al.* (2016) in Pakistan revealed that 0 veterinarians and 4 abattoir workers were tested positive for *M. bovis*. In our study there is no report of brucellosis, salmonellosis and staphylococcosis (Table 3) but Mudaliar *et al.* (2003); Shome *et al.* (2017) carried out a survey among veterinary workers in Delhi and Karnataka and reported seropositive cases as high as 27.7% and 7.02% respectively. Study conducted on veterinary students and doctors in the Netherlands revealed a lower MRSA carriage rate (Wulf *et al.*, 2006). The presence of toxoplasmosis 2 (0.5%) was lower than as reported by Rosypal *et al.* (2015) which was 5.6% in veterinary student. Amoebiasis and scabies

in veterinarian were 20 (5%) while other parasitic infection was 37 (9.5%). Our findings are suggestive of a low level of zoonotic diseases being rampant in the sampled population.

Psychological hazards

Work overload, exhaustion due to handling with animals, dealing and satisfying animal's owner, going to visit patients at their places etc. all these lead to mental stress and loss of working days. Low level of stress was shown by 137 (45%), moderate level by 104 (34%) and high level of stress was reported by 64 (21%) veterinarians. The results of the study are consistent with Fowler *et al.* (2016) they reported recent feelings of depression in 204 (25%) respondents.

Preventive health measures

Protective equipment used by participants in survey includes gloves by 60%, goggles by 1.1% and apron by 39.8%. However, 36.7% (134) participants did not use any of the protective gear during practices. All participants washed their hands properly after checking patients, similarly Aluko *et al.* (2016) showed that 100% health care worker followed effective hand washing before and after every clinical practice. Lack of prophylactic vaccination against zoonotic diseases ranked second most important constraint in dealing with life savings from zoonoses (Landge *et al.*, 2016). The study revealed that veterinarians have been vaccinated against diseases like tetanus, rabies and measles. The 350 (89%) participants were vaccinated against Tetanus, 260 (66.3%) against Rabies and 318 (81%) against Measles in their life time. The findings are comparable with the number of zoo veterinarians having vaccinations in Australia against Tetanus 95%, Rabies 70% and Measles 85% (Jeyaretnam, 2003). The study showed that 171 (43.6%), 122 (31.1%), 67 (17.1%), 32 (8.2%) veterinarians followed deworming at 6 month, 1 year, 2 year and more than 2 year intervals respectively. Nigam and Srivastav (2011) analyzed the details of deworming practiced by the Indian wildlife professionals and it was inferred that only 40.7% reported carrying out deworming in the last 6 months, 22.2% in the last 1 year and 12.9% had done it once in the last two years. 24.1% of the respondents did not follow routine deworming.

CONCLUSION

The physical injuries were most prevalent among

veterinarians. The awareness level concerning occupational hazards among the veterinary health professionals was near optimal but the need was felt to implement efforts aimed at addressing deterrence of occupational hazards by developing and executing improved and safe handling practices and safety measures. There are several limitations of this study. The study design did not include serological testing of veterinarians to detect the prevalence of zoonotic diseases. These findings are a preparatory point for further investigation into prevention of workplace hazards and a motivation for targeted injury prevention measures that could be instituted by individuals, practices, and veterinary governing bodies.

REFERENCES

- Aluko, O. O., Adebayo, A. E., Adebisi, T. F., Ewegbemi, M. K., Abidoye, A. T., Popoola, B. F. (2016). Knowledge, attitudes and perceptions of occupational hazards and safety practices in Nigerian healthcare workers. *BMC Research Notes*, 9: 71.
- American Veterinary Medical Association (1990). Guide to hazard communication. *Am. Vet. Med. Association*, 1-11.
- Bonini S., Buonacucina A., Selis L., Peli A., Mutti A. and Corradi, M. (2016). Occupational Hazards in Veterinarians: An Updating. *J Veterinar Sci. Techno.*, 7: 317.
- Epp, T. and Waldner, C. (2012). Occupational health hazards in veterinary medicine: Physical, psychological and chemical hazards. *Can. Vet. J.*, 53:151-157.
- Fowler, H. N., Holzbauer, S. M., Smith, K. E. and Scheftel, J. M. (2016). Survey of occupational hazards in Minnesota veterinary practices in 2012. *Journal of the American Veterinary Medical Association*, 248:207-218.
- Fritschi, L., Shirangi, A., Robertson, I. D. and Day L. M. (2008). Trends in exposure of veterinarians to physical and chemical hazards and use of protection practices. *Int. Arch. Occup. Environ. Health*, 81: 371-378.
- Hill, D. J., Langely R. L. and Marrow W. M. (1998). Occupational injuries and illnesses reported by zoo veterinarians in the United States. *J. Zoo Wildl Med.*, 39: 371-385.
- Jacobson, G. and Van Farowe, D. E. (1964). Dental radiological health program. *J. Mich. State Dent. Ass.*, 46.
- Jeyaretnam, J. and Jones, H. (2000). Physical chemical and biological hazards in veterinary practice. *Aust Vet. J.*, 78, 751-758.
- Jeyaretnam, J. S. (2003). Occupational hazards and radiation safety in veterinary practice including zoo veterinary practice in Australia. Edith Cowan University.
- Khattak, Mushtaq, M. H., Ahmad, M. U. D., Khan, M. S. and Haider, J. (2016). Zoonotic tuberculosis in occupationally exposed groups in Pakistan. *Occupational Medicine*, 66:371-376.
- Kutlu, M., Ergonul, O., Sayin- Kutlu, S., Guven, T. and Ustun, C. (2014). Risk factors for occupational brucellosis among veterinary personnel in Turkey. *Prev. Vet. Med.*, 117:52-58.
- Landge, S., Tripathi, H., Agarwal, R. K. and Banthiya, V. (2016). Knowledge Level of Veterinarians about Occupational Health Hazards and the Constraints Felt by them for Safe and Hazard Free Working Conditions. *Journal of Veterinary Public Health*, 9: 75-82.
- Leggat, P., Smith, D. and Speare, R. (2009). Hand dermatitis among veterinarians from Queensland, Australia. *Contact Dermatitis*, 60:336-338.
- Moore, R. M. Jr., Davis, Y. M. and Kaczmarek R. G. (1993). An overview of occupational hazards among veterinarians, with particular reference to pregnant women. *Am. Ind. Hyg. Assoc. J.*, 54: 113-120.
- Mudaliar, S., Bhore, A. and Pandit, D. (2003). Detection of antibodies to *Brucella abortus* in animal handlers. *Ind. J. Med. Sci.*, 57:181-186.
- Nienhaus, A., Skudlik, C. and Seidler, A. (2005). Work-related accidents and occupational diseases in veterinarians and their staff. *Int Arch Occup Environ Health*, 78:230-238.
- Nigam, P. and Srivastav, A. (2011). Assessing occupational hazards among Indian wildlife. Assessing occupational hazards among Indian wildlife health professionals. *Vet. Arhiv.*, 81: 731-741.
- Roberts, J. A. (1995). Occupational health concerns with nonhuman primates in zoological gardens. *J. Zoo. Wildl. Med.*, 26:10-23.
- Rosypal A. C., Houk A. E., Zajac A. M. and Lindsay D. S. (2015). Prevalence of IgG antibodies to *Toxoplasma gondii* in veterinary and undergraduate students at Virginia Tech, Blacksburg, Virginia. *Zoonoses Public Hlth.*, 62: 553-556.

- Shirangi, A., Fritchi, C. and Holman, D. J. (2007). Prevalence of occupational exposure and protective practices in Australian female veterinarians. *Aus. Vet. J.*, 85: 32-38.
- Shome, R., Kalleshmurthy, T., Shankaranarayana, P. B., Giribattanvar, P., Chandrashekar, N., Mohandoss, N. and Rahman, H. ((2017). Prevalence and risk factors of brucellosis among veterinary health care professionals. *Pathogens and Global Health*, 111: 234-239.
- Weese, J. S. and Jack, D. C. (2008). Needlestick injuries in veterinary medicine. *The Canadian Veterinary Journal*, 49: 780.
- Woods, G. T., Schnurrenberger, P. R., Martin, R. J. and Tompkins, W.A.F. (1981). Swine influenza-virus in swine and man in Illinois. *J. Occup. Environ. Med.*, 23: 263–267.68.
- Wulf, M., Van Nes, A., Eikelenboom-Boskamp, A., de Vries, J., Melchers, W., Klaassen, C. and Voss, A. (2006). Methicillin-resistant *Staphylococcus aureus* in veterinary doctor and students. *Emerg. Infect. Dis.*, 12: 1939–1941.
- Yohannes, M. and Gill, J. P. S. (2011). Seroepidemiological survey of human brucellosis in and around Ludhiana, India. *J. Emerging Health's Threats*, 4: 7361.

Received: August 13, 2021

Accepted: September 6, 2021