Research Article

SOCIO-ECONOMIC ANALYSIS OF POTATO GROWING FARMERS IN KANGRA DISTRICT OF HIMACHAL PRADESH

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Abstract: Potato is a principal cash crop in Himachal Pradesh. The production of potato is 198.66 thousand tonnes in 2017-18 and shares a major part in the vegetable production in the state. The socio-economic survey of sample farms in study area revealed that the average family size was composed of 5 members and majority of family members (27%) were in the age group of 16-30 years. Agriculture along with livestock was the main occupation of majority of sampled farm. The pattern of land utilization pattern showed that the average size of farm holdings was 0.82 ha out of which nearly two-third (66%) was under irrigation. The average number of animals maintained on an average farm was 3.13. In *Kharif* season, vegetable crops were the most important crops and in *Rabi* season potato was most important. The per farm productivity of potato varied from 160.80 q/ha on small farm to 168.60 q/ha on large farms. About 50 percent of the total farm's income was generated by agriculture and allied activities and out of total income generated through agriculture, about 10 percent was contributed by potato crop. This crop contributed three times more towards the total income of the large farms than contribution in the income of small farms. The contribution of non-farm income in the total income of farmers was found to be about 43 to 47 percent across the different categories of farms. Results showed that socio-economic conditions of farmers also greatly affect the organisation and management of farms, Large farmers have better potato production because of better socio economic condition.

Keywords: Socio-economic character, Education Status, Sex Ratio, Cropping Pattern

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Introduction

Potato is a principal cash crop in Himachal pradesh. The production of potato is 198.66 thousand tonnes in 2017-18 and shares a major part in the vegetable production in the state. Data was collected from 60 farmers selected through the proportional allocation from villages of two blocks namely Bhawarna and Nagrota Bagwan. Potato of this region has a high percentage of dry matter (20 percent) highly recommended for the production of chips. The crop is generally harvested in May and can be supplied till July by the local farmers. In the Kangra district, specifically along the Palampur and Nagrota Bagwan belt the catch is generally got demand from the food processing industries. Due to geographical and topographical reasons the supply of farming land is very limited. Regardless production of high value cash crops is increasing in the state because tthey provides higher returns and promote agribusiness.

Methodology

List of potato growing blocks in the district was prepared and arranged in descending order based on the area under crop. The first two potato growing blocks were selected purposively. Two stage sratified random sampling technique was used in this study. In the first stage potato growing five villages were selected from each potato growing blocks by consulting officials from state agriculture department. In the second stage of sampling, a complete list of farmers growing the potato in each sample village was prepared with the help of revenue officials. Keeping the time and resources availability at the disposal of the researcher in view, a manageable sample of 60 farmers was drawn from the selected villages through the proportional allocation technique. 28 small and 32 large farmers were selected by cube root cumulative frequency method.

Result and Discussion

An examination of the socio-economic status of the sample farmers is necessary in order to improve their economic status through suitable measures. The information on socio-economic parameters *viz.*, size of family, educational status, ownership of land, cropping pattern, *etc.* have been analysed and presented in the following sections:

Family structure and size

Family size is an important indicator determining the social and economic wellbeing of the family and plays a vital role in farm business activities. The adoption and selection of farm enterprises is influenced by size of family especially where hired labour is not available. The distribution of sample farms according to the size of the family in the study area is presented in [Table-1]. The table shows that more than 61 percent of farms were having the family size of 5 to 7 members following 1 to 4 members (20%) and 8 and above family members (18.33%). This shows that about 80 percent of the farms were having the larger family size of 5 persons & above, where the parents were living with their married children. The proportion was however, fairly high (84.37%) in case of large farms compared to small farms (75%). The family size of 1 to 4 persons was reported by only 20 percent of farmers and its proportion was fairly higher on small farms (25%) than large farms (15.63 %).

The average size of family was 5.03 and it ranged between 4.82 persons in small to 5.21 persons in large farms.

Sex-wise distribution

Since farming is a labour-intensive occupation, therefore, numbers as well as male and female distribution of family members determines the well being of farm families. [Table-2] shows sex-wise distribution of family members. It can be seen from the table that number of males were higher than the number of females in both categories of the farms. The composition of family consisted of 4 adults and 1 child. The table further reveals that the proportion of male child was higher (12.33%) than the female child (6.96%) in all the categories of farms.

Table-1 *Distribution of sample farms according to family size and structure, (No.)*

SN	Family size	Small	Large	Overall
1	1-4 members	7(25.00)	5(15.63)	12(20.00)
2	5-7 members	16(57.14)	21(65.62)	37(61.67)
3	8 and above members	5(17.86)	6(18.75)	11(18.33)
4	Total sample farms	28(100.00)	32(100.00)	60(100.00)
5	Total family members	135	167	302
6	Average size of family	4.82	5.21	5.03

Note: Figures in parentheses indicate percentage to the total in each category

Table-2 *Family size and sex-wise distribution of family members, (No./farm)*

SN	Particular	Small	Large	Overall
1	Male	2.68(55.60)	2.84(54.51)	2.77(54.07)
	a) Adult	2.14(44.40)	2.15(41.27)	2.15(42.74)
	b) Children*	0.54(11.20)	0.69(13.24)	0.62(12.33)
2	Female	2.14(44.40)	2.37(45.49)	2.26(44.93)
	a) Adult	1.75(36.31)	2.06(39.54)	1.91(37.97)
	b) Children*	0.39(8.09)	0.31(5.95)	0.35(6.96)
3	Total	4.82(100.00)	5.21(100.00)	5.03(100.00)
	a) Adult	3.89(80.70)	4.21(80.81)	4.07(80.91)
	b) Children*	0.93(19.30)	1.00(19.19)	0.96(19.09)

Note: Figures in parentheses indicate percentages to the total in each category
*Children below 15 years age

Age-wise distribution

The age of head of a family plays an indispensable role in responding to scientific innovation and new thinking. [Table-3] depicts the age of the head/respondent of family of the sample farms. A cursory look at the table reveals that on an average the majority of the heads of the family were in the age group of 41 to 60 years of age followed by above 60 years of age. The percentage of heads in the age group of upto 40 years was comparatively less (10%). The comparison across small and large category of sample farms reveals that percentage of head in the age group of upto 40 years and 41 to 60 years was slightly higher in case of small farms. On the other side, the percentage of heads of family above 60 years of age group was high on large farms (31.25%) than the small farms (25.00%).

Table-3 *Distribution of the sample farms according to the age of head of family, (No.)*

SN	Age groups (Years)	Small	Large	Overall
1	Up to 40	3(10.72)	3(9.38)	6(10.00)
2	41-60	18(64.28)	19(59.37)	37(61.67)
3	Above 60	7(25.00)	10(31.25)	17(28.33)
	Total	28(100.00)	32(100.00)	60(100.00)

Note: Figures in parentheses indicate percentages to the total in each category

Educational status of family

The educational status of the head of family plays a significant role in making judicious decisions on the farm to adopt new technologies and innovations for efficient allocation of scare resources and maximizing the returns per unit of input. Keeping this in view, the education status of the head of family as well as other members has been analysed and given in [Table-4]. It can be observed from the [Table-4] that more than 98 percent of the heads of the family were literate and 100 percent literacy was observed among the large farms. Among the majority of the heads were found to be educated upto matric or high school standard. Nearly ten percent of the heads of families were having the level of education upto graduate and above that on an average farm. However, the proportion was higher

on small farms as compared to large farms. Similar results were also reported by Quadri et al. (2013).

Table-4 *Education status of the head of the family of sample farms, (No.)*

SN	Level of education	Small	Large	Overall
1	Illiterate	1(3.57)	-	1(1.67)
2	Primary	6(21.43)	5(15.62)	11(18.33)
3	Middle	3(10.71)	9(28.13)	12(20.00)
4	Matric	10(35.71)	9(28.13)	19(31.67)
5	Senior secondary	4(14.29)	7(21.87)	11(18.33)
6	Graduate and above	4(14.29)	2(6.25)	6(10.00)
	Total	28(100.00)	32(100.00)	60(100.00)
	Literacy rate (%)	96.42	100.00	98.33

Note: Figures in parentheses indicate percentages to the total in each category

Occupational structure

The occupation of the head of the family directly determines the income of the family and economic soundness of the households. [Table-5] gives the occupational pattern of the head of the family of sample farms. Agriculture including livestock was found to be the major source of livelihood for majority of the heads of the families. The proportion of heads of family engaged in agriculture was about 62 percent on the average revealing very high dependence on agriculture. The proportion of heads of families having agriculture as the source of occupation was, however significantly higher in case of large farms as compared to small farms. The next important source of occupation was the service sector in which 20 percent of total heads were engaged. A very small fraction of about three percent of the heads of the families was engaged as agricultural and other daily paid labourer. Across small and large category of farms not much significant difference was noticed in the proportion of heads employed in service sector.

Table-5 *Occupational pattern of the head of the family, (No.)*

SN	Occupation	Small	Large	Overall
1	Agriculture including livestock	15(53.37)	22(68.75)	37(61.67)
2	Private service	1(3.57)	2(6.25)	3(5.00)
3	Government service	5(17.86)	4(12.50)	9(15.00)
4	Business	-	1(3.12)	1(1.67)
5	Daily paid labourer	2(7.14)	-	2(3.33)
6	Others (artisans, craftsman, *etc.*)	5(17.86)	3(9.38)	8(13.33)
	Total	28(100.00)	32(100.00)	60(100.00)

Note: Figures in parentheses indicate percentages to the total in each category

Land holdings and utilization

The size of holding that a farm household owns shows the basic strength of the farming family and its utilization reveals how efficiently this natural resource is used by the farmers. The distribution of holdings under different categories of farm is set out in [Table-6]. The table reveals that the average size of farm holding was about 0.82 ha out of which about 66 percent was irrigated. About two percent of total land holding was leased-out as against about ten percent of leased-in area on an average farm. The average size of operational holding was found to be 0.62 ha which constitutes about 76 percent of total land holding. The comparison across small and large category of farm revealed that the average size of operational holding increased with the size of holding. The table further revealed that on an average farm more than 80 percent of the operational holding was under irrigation. The main sources of irrigation were kulhs in the study area. It can also be seen from the table that proportion of area under fallow land to total holding decreased with size of the holding. It ranged between 7.61 percent on large farms to 11.43 percent of total holding on small farms.

Livestock inventory

Rearing of livestock along with farming is necessary to derive most income and to augment the benefits from their mutual association. Further, the structure of livestock in an area broadly speaks of the destinations of the scenario in which it is undertaken by the farmers. the inventory of livestock on sample farms has been analysed and is presented in [Table-7]. As may be seen from the table, the average number of animals maintained on an average farm in the study area was 3.13. The large farms had kept slightly more animals (3.34) as compared to small farms (2.94).

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Table-6 *Land inventory and its utilization on sample farms, (ha /farm)*

SN	Particulars	Small			Large			Overall		
		UIR	IR	Total	UIR	IR	Total	UIR	IR	Total
1	Owned land	0.23	0.41	0.64	0.29	0.57	0.86	0.25	0.48	0.76
		(100.00)	(87.24)	(91.43)	(100.00)	(90.48)	(93.48)	(100.00)	(88.89)	(92.68)
2	Leased in	-	0.07	0.07	-	0.09	0.09	-	0.08	0.08
			(14.89)	(10.00)		(14.28)	(9.78)		(14.81)	(9.76)
3	Leased out	-	0.01	0.01	-	0.03	0.03	-	0.02	0.02
			(2.13)	(1.43)		(4.76)	(3.26)		(3.70)	(2.44)
4	Total land holding	0.23	0.47	0.70	0.29	0.63	0.92	0.25	0.54	0.82
		(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)
i	Operational holding	0.07	0.46	0.53	0.09	0.60	0.69	0.08	0.52	0.62
		(30.44)	(97.87)	(75.71)	(31.03)	(95.24)	(75.00)	(32.00)	(96.30)	(75.61)
ii	Orchards	-	0.01	0.01	-	0.03	0.03	-	0.02	0.02
			(2.13)	(1.43)		(4.76)	(3.26)		(3.70)	(2.44)
iii	Pastures/grasslands	0.08	-	0.08	0.13	-	0.13	0.10	-	0.11
		(34.78)		(11.43)	(44.83)		(14.13)	(40.00)		(13.41)
iv	Fallow land	0.08	-	0.08	0.07	-	0.07	0.07	-	0.07
		(34.78)		(11.43)	(24.14)		(7.61)	(28.00)		(8.54)

Note: Figures in parentheses indicate percentages to the total in each category, UIR= Un-irrigated, IR= Irrigated

Table-8 *Cropping pattern on sample farms*

SN	Particulars	Small		Large		Overall	
		Area (ha)	% of total cropped area	Area (ha)	% of total cropped area	Area (ha)	% of total cropped area
A	*Kharif*						
1	Maize	0.07	6.6	0.09	6.62	0.08	6.83
2	Paddy	0.13	12.27	0.18	13.24	0.16	13.68
3	Vegetables	0.24	22.64	0.3	22.06	0.27	20.51
I	Tomato	0.05	4.72	0.06	4.41	0.05	4.27
Ii	Capsicum	0.02	1.89	0.03	2.21	0.02	1.71
Iii	Chilli	0.02	1.89	0.03	2.21	0.02	1.71
Iv	Brinjal	0.03	2.83	0.02	1.47	0.02	1.71
V	Cucumber	0.04	3.77	0.05	3.7	0.04	3.41
Vi	Okra	0.04	3.77	0.05	3.7	0.04	3.41
vii	Other vegetables	0.04	3.77	0.06	4.41	0.05	4.27
4	Fodder (*Chari/Bajra*)	0.09	8.49	0.12	8.82	0.11	9.4
	Sub-Total	0.53	50	0.69	50.74	0.62	50.42
B	*Rabi*						
1	Wheat	0.18	16.98	0.11	8.09	0.14	10.26
2	Fodder (*Berseem/Oat*)	0.05	4.72	0.02	1.47	0.03	3.42
3	Potato	0.13	12.26	0.47	34.56	0.31	26.5
4	Vegetables	0.17	16.04	0.07	5.14	0.13	9.4
I	Cabbage	0.05	4.72	0.02	1.47	0.03	3.41
Ii	Cauliflower	0.04	3.77	0.02	1.47	0.03	1.71
Iii	Onion	0.02	1.89	0.01	0.73	0.01	1.71
Iv	Garlic	0.01	0.94	0.01	0.73	0.01	0.86
V	Other vegetable	0.05	4.72	0.01	0.73	0.03	1.71
	Sub-total	0.53	50	0.67	49.26	0.61	49.58
C	Total cropped area	1.06	100	1.36	100	1.23	100
D	Net sown area	0.53		0.69		0.62	
	Cropping intensity (%)	200		197.1		198.39	

Table-7 *Inventory of livestock on sample farms, (No./farm)*

SN	Particulars	Small	Large	Overall
1	Local cow			
	In milk	0.36	0.47	0.42
	Dry	0.57	0.72	0.65
	Total	0.93	1.19	1.07
	Improved cow			
	In milk	0.43	0.62	0.53
	Dry	0.21	0.25	0.23
	Total	0.64	0.87	0.76
2	Buffaloes			
	In milk	0.36	0.44	0.40
	Dry	0.07	0.09	0.08
	Total	0.43	0.53	0.48
3	Heifer			
	Cow(local)	0.11	0.16	0.13
	Cow(improved)	0.25	0.12	0.18
	Buffalo	0.18	0.19	0.18
4	Calves	0.04	0.03	0.03
5	Bullocks	0.36	0.25	0.30
	Total livestock	2.94	3.34	3.13

On an average the farms had kept about two cows and less than one buffalo. The practice of rearing sheep and goat and poultry production was found to be missing in the study area. The results also revealed that local cows were most popular on both the categories of farms, but farmers were also found to keep improved cows due to their higher milk yield than local cows. Only few farmers were found to keep bullocks for ploughing which varied from 0.36 on small farms to 0.25 on large farms.

Cropping pattern
Cropping pattern indicates the allocation of operational holding under different crops at a particular period of time and thus, reveals the relative importance of each crop in cultivated area. The study of cropping pattern is important to know the extent of crop diversification in a particular region. The cropping pattern of the farms in the study area is given in [Table-8]. It can be seen from the table that in *kharif* season vegetable crops were the most important crops and occupied the maximum proportion (20.51%) of the total cropped area followed by paddy (13.68%) and fodder crops (9.40%). Tomato, cucumber and okra were the main vegetables grown during the *kharif* season.

Across small and large category of farms no significant difference was observed with respect to allocation of total cropped area under different crops in the *kharif* season. In *rabi* season, the potato emerged out the most important crops, occupying more than 26 percent of total cropped area on an average farm. The most important crop grown was wheat. The vegetable crops also accounted for about nine percent of the total cropped area. In the *rabi* season a noticeable difference was in the allocation of total cropped area under different crops among small and large category of farms. The proportion of total cropped area under potato crop in case of large farms (34.56%) was found to be two and half times more as compared to the small farms (12.26%). Whereas the proportion of the total cropped area under vegetable crop was, comparatively higher on small farms than on large farms. The similar pattern as that of vegetables was also observed in the allocation of area under wheat and fodder crops across small and large category of farms. The cropping intensity, which signifies the extent of crop intensification on the farm, came out to be 198.39 percent on overall farms and it was 200 percent in case of small farms and 197.10 percent in case of large farms.

Crop production

The production of different crops on per farm basis has been worked out and displayed in [Table-9]. It was found from the table that among food grains paddy gave the maximum production of 7.06 quintal per farm on an average farm followed by wheat (4.33 q/farm) and maize (2.64 q/farm). The per farm production of maize and paddy was more on large farms as compared to small farms. The table further reveals that small farms were found to produce 40 percent more of wheat on their farms as compared to large farms. Among fodder crops the per farm production was maximum in case of berseem (13.81 q/farm) followed by oats (8.40 q/farm), chari (4.65 q/farm) and bajra (3.62 q/farm). Across small and large category of farms except other fodder crops a significant difference was noticed only on the per farm production of oats that was nearly double in large farms than small farms. The per farm production of potato was quite high in case of large farms. It was found to be to the extent of about 74 quintals per farm in case of large farms as against about 23 quintals per farm under small farms. On an average farm it stood at about 51 quintal per farm. With respect to other vegetables grown by the farms, except cauliflowers, cabbage the per farm production of other vegetables such as okra, brinjal, tomato and cucumber was more on large category of farms.

Table-9 *Production of different crops on sample farms, (q/farm)*

SN	Crops	Small	Large	Overall
1	Maize	2.11	3.06	2.64
2	Paddy	5.28	8.22	7.06
3	Wheat	6.30	4.50	4.33
4	Chari	4.25	6.33	4.65
5	Bajra	3.58	3.66	3.62
6	Oats	13.80	7.61	8.40
7	Berseem	13.61	14.00	13.81
8	Vegetables			
I	Cucumber	6.60	8.67	6.75
Ii	Cauliflower	5.55	3.50	3.54
Iii	Okra	5.40	7.05	5.51
Iv	Brinjal	5.42	3.51	3.58
V	Tomato	5.38	7.20	5.50
Vi	Potato	22.51	74.18	50.84
Vii	Cabbage	8.15	3.00	6.32

Crop productivity

The output per unit of area of a crop is represented through yield rate which generally speaks of the economic importance of that crop. For this, the average yields of different crops in the study area have been worked out and are shown in [Table-10]. It can be seen from the table that the productivity of all the food grain crops was comparatively higher on large category of farms. On an average farm it was found to be 32.63 q/ha, 43.57 q/ha and 36.25 q/ha for maize, paddy and wheat crop respectively. The productivity of potato was 165 q/ha on an average farm and did not differ significantly from small to large farms as it ranged between 160 to 169 q/ha. The productivity of other vegetables grown by the farms was

found to be more, less or same across the small and large category of farms. For cauliflower, cucumber and brinjal it stood in the range of 165 to 180 q/ha and in case of cabbage and okra it was about 157 and 137 q/ha and for tomato it was quite low as compared to other vegetables (113.78 q/ha).

Table-10 *Productivity of different crops on sample farms, (q/ha)*

SN	Crops	Small	Large	Overall
1	Maize	30.21	34.00	32.63
2	Paddy	40.64	45.65	43.57
3.	Wheat	35.00	37.50	36.25
4	Chari	106.55	126.25	116.33
5	Bajra	71.65	61.00	65.78
6	Oats	460.20	380.65	420.83
7	Berseem	680.67	700.10	690.35
8	Vegetables			
i	Cucumber	165.00	173.33	168.75
ii	Cauliflower	185.08	175.00	177.23
ii	Okra	135.00	140.98	137.43
iv	Brinjal	180.85	175.67	178.26
v	Tomato	107.56	120.00	113.78
vi	Potato	160.80	168.60	165.00
vii	Cabbage	163.00	150.55	156.63

Farm, off farm and non-farm income

The farm and non-farm activities are the main source of income and off farm income constitutes small proportion of total income of the farms. The farm income was estimated as value of main product and by products net of the cost on account of seed, fertilisers, pesticides, payment to hired labour and draft power. The income generated by family members as agricultural labourer on other farmer's fields was taken as off farm income. The income generated from non-agricultural activities such as services, business/trade/shop, non-agricultural labour *etc*. were considered as no farm income.

Table-11 *Composition of farm and non-farm income on sample farms, (Rs /farm)*

SN	Particulars	Small	Large	Overall
I	Farm income			
1	Agriculture	116271 (46.89)	186170 (52.05)	152414 (49.91)
i	Potato	10891 (4.39)	47638 (13.32)	29353 (9.61)
ii	Other crops	105380 (42.50)	138532 (38.73)	123061 (40.30)
2	Livestock	14050 (5.67)	18440 (5.15)	16391 (5.37)
	Sub-total	130321 (52.56)	204610 (57.20)	168805 (55.28)
II	Non-farm income			
1	Trade/shop	21076 (8.50)	40685 (11.37)	31534 (10.33)
2	Government service	55581 (22.41)	63078 (17.64)	59579 (19.51)
3	Private service	38045 (15.34)	45634 (12.76)	42092 (13.79)
4	Non- agricultural labourer	2958 (1.19)	3672 (1.03)	3339 (1.09)
III	Sub-total	117660 (47.44)	153069 (42.80)	136544 (44.72)
	Total	247981 (100.00)	357679 (100.00)	305350 (100.00)

Note: Figures in the parentheses indicate percentages to the total in each category

The different components of farm and non-farm income are presented in [Table-11]. The table reveals that about 50 percent of the total farmer's income was generated by agriculture and out of whole about ten percent was from potato crop. About five percent of farmer's income accrued from livestock. The comparison across the small and large category of farms revealed that potato contributed three times more towards the total income of the large farms than contribution in the income of small farms. The contribution of livestock to the total income of the farms, however, did not differ among small and large farms. The share of farm income in the total income of farmers was found to be about 55 percent on an average farm and did not reveal any wide disparity among small (52.56%) and large farms (57.20%).

In the non-farm income, the component of services both government services and private services were the major one that contributed more than 33 percent to the total income. The contribution of this sector was comparatively higher in case of small farms (37.75%) than those of large farms (30.40%). The business/ trade/shop also contributed about ten percent to total income. The non-agricultural labourer components contribution was very low (1.09%). The contribution of non-farm income in the total was found to be the extent of about 45 percent and it ranged between 42.80 percent in large farms to 47.44 percent in small farms.

Conclusion

The socio-economic profile of the sample farmers of any particular region helps in understanding the constraints vis-a-vis potential of development. It also offers vital clues and insight for devising appropriate development programme for future. The socio-economic conditions of farmers also greatly affect the organisation and management of farms. Therefore, large farms having higher land holding have more efficient organization and their main occupation was agriculture and allied activities. Large farms also have more production and productivity of potato crop because of efficient use of resources.

Application of research: The study will be useful to the planners and policy makers for formulating the various policies for the benefit and well-being of potato growers.

Research Category: Socio-economic analysis, Potato growers

Abbreviations: ha: Hectare, Kg: Kilogram, Q: Quintal, MT: Metric Tons

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Research project name or number: MSc Thesis (Analysis of Production and marketing of Potato in Kangra District of Himachal Pradesh

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Study area / Sample Collection: Kangra, Himachal Pradesh

Cultivar / Variety name: Potato crop

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Ethical approval: This article does not contain any studies with human participants or animals performed by any of the authors.
Ethical Committee Approval Number: Nil

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