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Knowledge, attitude and perception on medicinal plants and traditional medicines in Bangladesh: A cross-sectional study

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Abstract
Medicinal Plants (MP) and Traditional Medicine (TM) have long been practised in Bangladesh. The descriptive type of cross-sectional survey study has conducted to evaluate the KAP on MP and TM in Bangladesh with a sample size of 2535. A face-to-face interview questionnaire has been used for data collection in 8 clusters in Bangladesh. Both descriptive and inferential statistics have been used for data analysis with a level of significance set at < .05 and < .001. The research found the Mean ± SD age 39.07±12.119 years, followed by 87.6% Muslim, 78.8% married, 28.8% up to primary level education, 27% occupation was housewife, 43.3% monthly income was 10,000-20,000 BDT, and 41.1% respondents perceived health status was good. The research also found that 28.5% age group 18-25 years, 39.2% age group 36-65 years, 46.7% of males, and 20.9% of females of the respondents had opined that MP is effective in the treatment of illness. Out of all 19.3% age group 18-35 years, 30.1% age group 36-65 years, 33.1% of male, and 16.8% of female respondents had also opined that TM is effective in the treatment of illness. As a whole 22.7% age group 18-35 years, 32.6% age group 36-65 years, 36.5% of males, and 18.8% of female respondents believed that TM is well accepted by the community in Bangladesh. In conclusion, the research will bring to the fore the importance of the Traditional Health Care System and expand knowledge on the current debates on the efficacy, safety, and reliability of MP and TM as well as its possible mainstreaming into modern health care.

Keywords: Bangladesh, medicinal plants, traditional medicines, primary health care

Introduction
The importance of Medicinal Plants (MP) is still growing although it varies depending on the ethnological, medical and historical background of each country. The WHO established that, in many developing and developed countries in the world, Traditional Medicines (TM) play an important role in meeting the Primary Health Care (PHC) needs of the population and highlighting specific types of this medicine [1].

In Bangladesh, Medicinal Plants (MP) and Traditional Medicines (TM) have long been practiced and it is estimated that 70-75% population of the country still use MPs and TMs for the management of their health problems of various kinds [2, 3].

Bangladesh is full of MP which is a potential source of drugs. Drugs from this Medicinal Plants (MP) have been widely used even in this modern era. Traditionally it is believed that these plants have very little side-effects and it cost almost nothing in a few cases. So, it can solve the economic problem for the poor and can play a vital role in the health economic sector [4]. There is a much more unparalleled demand for natural medicines, green health products, pharmaceuticals, food supplements, cosmetics, and herbal pesticides, which is bringing about this alarming loss of plant biodiversity. It is estimated that 70-80% of people worldwide rely chiefly on Traditional, largely Natural Medicines (NM) or Alternative Medicine to meet their Primary Health Care needs [5]. In some Asian and African countries, 80% of the population depends on herbal treatment [6]. Worldwide it is estimated that 80% of the population uses herbs; in the developing world, rates could be as high as 95% [7]. Abelson (1990) estimated that 75% of the global population uses MP and plant extracts for their medicinal needs [8]. It was pointed out that the dependence of more than 80% of the developing world on TM, predominantly plants, for Primary Health Care [9, 10].

Materials and Method
It was a descriptive type of cross-sectional survey study. A pre-tested, modified, and semi-

structured face-to-face interview questionnaire was used for data collection from April 2018 to February 2019. The population has been chosen for the research consists of the urban and rural communities of Bangladesh and has been selected randomly by a multi-stage cluster sampling technique at the national level. The urban and rural communities have been selected following the population census 2011 conducted by the Bangladesh Bureau of Statistics. A separate survey of Dhaka City Corporation (DCC) has been conducted. 2535 adult individuals with an age ≥ 18 years have been regarded as the study subjects. All households (HHs) in the urban community were given numbers by DCC and Pourasava authority while the households (HHs) in the rural community were given by the Union Parishad authority. Considering the specific inclusion and exclusion criteria, one member (male or female) from each household was included in the study.

The questionnaire was drafted in the local language (Bangla version) to get feedback on the suitability, appropriateness, and sequencing of the questions. Both open and close-ended questions were asked of respondents in this research. Five undergraduate students from a private university in Bangladesh were appointed to assist the researcher. To respond to the questions of situation and perception of the use of MP and TM and satisfaction among respondents, an index of "Yes" or "No" was applied. For questions of attitudes toward MPs and TMs use among respondents, a 5-point Likert scale ranging from 1 = "Strongly agree" to 5 = "Strongly disagree" was applied. The raw data were analyzed using the statistical package of social sciences (IBM SPSS) software version 20. Descriptive statistics including percentages means and standard deviation were used to characterize the sample in relation to the study variables. The association between dependent and independent variables was applied by the chi-square test. Since this study was not involved in experimental research involving human subjects and also anonymization of personal identity was preserved, the concept of exemption of ethical approval was accepted at that time.

Results

Table 1: Demographics pattern of the respondents in Bangladesh (N = 2535)

Categories		Sex						P-Value
		Male		Female		Total		
		N	%	n	%	n	%	
Age	18-25	224	8.8	168	6.6	392	15.5	**
	26-35	382	15.1	267	10.5	649	25.6	
	36-45	540	21.3	243	9.6	783	30.9	
	46-55	286	11.3	124	4.9	410	16.2	
	56-65	219	8.6	82	3.2	301	11.8	
	Total	1661	65.1	884	34.9	2535	100.0	
	Mean ± SD =	39.07±	12.119					
Religion	Muslim	1471	58.0	750	29.6	2221	87.6	*
	Hindu	146	5.8	100	3.9	246	9.7	
	Christian	34	1.3	34	1.3	68	2.7	
	Total	1651	65.1	884	34.9	2535	100.0	
Marital Status	Married	1295	51.0	705	27.8	2000	78.8	**
	Single	308	12.1	110	4.3	418	16.4	
	Divorced	9	0.4	4	0.2	13	0.6	
	Separated	9	0.4	2	0.1	11	0.5	
	Widow/widower	30	1.2	63	2.5	93	3.7	
	Total	1651	65.1	884	34.9	2535	100.0	
Education	Up to primary	423	16.7	308	12.1	731	28.8	**
	Secondary	235	9.3	125	4.9	360	14.2	
	SSC Pass	262	10.3	169	6.7	431	17.0	
	HSC, Dip. & Voc	369	14.5	169	6.7	538	21.2	
	Graduate & Above	263	10.4	104	4.1	367	14.5	
	Madrasa Education	99	3.9	9	0.4	108	4.3	
	Total	1651	65.1	884	34.9	2535	100.0	
Occupation	Service Holder	608	24.0	88	3.5	696	27.5	**
	Farmer	150	5.9	0	0.0	150	5.9	
	Student	121	4.8	57	2.2	178	7.0	
	Housewife	0	0.0	684	27.0	684	27.0	
	Business	556	21.9	11	0.4	567	22.3	
	Day Laborer	150	5.9	4	0.2	154	6.1	
	Others	66	2.6	40	1.6	106	4.2	
	Total	1651	65.1	884	34.9	2535	100.0	
Monthly Income (in BDT)	Up to 10000	352	21.8	27	1.7	379	23.5	n. s.
	10000-20000	641	39.6	59	3.6	700	43.3	
	20000-30000	349	21.6	44	2.7	393	24.3	
	30000-40000	77	4.8	6	0.4	83	5.1	
	> 40000	59	3.6	3	0.2	62	3.8	
	Total	1478	91.4	139	8.6	1617	100.0	
Health status	Very good	349	13.8	191	7.5	540	21.3	*
	Good	718	28.3	324	12.8	1042	41.1	
	Average	513	20.2	316	12.5	829	32.7	
	Poor	48	1.9	41	1.6	89	3.5	
	Very poor	23	0.9	12	0.5	35	1.4	
	Total	1651	65.1	884	34.9	2535	100.0	

Chi-square test: *p<.05, **p<.001; n. s. = not significant

Table 2: Knowledge and training on primary health care, medicinal plants and traditional medicines (N=2535)

Categories		Age						p-value	Sex						p-Value
		18-35 yrs		36-65 yrs		Total			Male		Female		Total		
		N	%	N	%	N	%		N	%	N	%	N	%	
Knowledge on PHC	Yes	926	36.5	1115	44.0	2041	80.5		1362	53.7	679	26.8	2041	80.5	
	No	115	4.5	379	15.0	494	19.5	**	289	11.4	205	8.1	494	19.5	**
	Total	1041	41.1	1494	58.9	2535	100.0		1651	65.1	884	34.9	2535	100.0	
Training on PHC	Yes	163	6.4	230	9.1	393	15.5		309	12.2	84	3.3	393	15.5	
	No	878	34.6	1264	49.9	2142	84.5	n. s.	1342	52.9	800	31.6	2142	84.5	**
	Total	1041	41.0	1494	59.0	2535	100.0		1651	65.1	884	34.9	2535	100.0	
Idea on MP & TM	Yes	519	20.5	788	31.1	1307	51.6		945	37.3	362	14.3	1307	51.6	
	No	522	20.5	706	27.9	1228	48.4	n. s	706	27.8	522	20.6	1228	48.4	**
	Total	1041	41.0	1494	59.0	2535	100.0		1651	65.1	884	34.9	2535	100.0	
MP & TM is/are essential for PHC	Strongly agree	278	11.0	315	12.4	593	23.4		383	15.1	210	8.3	593	23.4	
	Agree	418	16.5	594	23.4	1012	39.9		676	26.7	336	13.3	1012	39.9	
	Neutral	305	12.0	555	21.9	860	33.9	**	551	21.7	309	12.2	860	33.9	n. s.
	Disagree	37	1.5	21	0.8	58	2.3		31	1.2	27	1.1	58	2.3	
	Strongly disagree	3	0.1	9	0.4	12	0.5		10	0.4	2	0.1	12	0.5	
	Total	1041	41.1	1494	58.9	2535	100.0		1651	65.1	884	34.9	2535	100.0	

Chi-square test: *p <.05, **p<.001; n. s. = not significant, PHC = Primary Health Care, MP = Medicinal Plants, TM = Traditional Medicines

Table 3: Attitude of the respondents on medicinal plants and traditional medicines (N=2535)

Categories		Age						p-value	Sex						p-value
		18-35 yrs		36-65 yrs		Total			Male		Female		Total		
		n	%	n	%	n	%		n	%	n	%	n	%	
Use MP in last 12 months	Yes	693	27.4	1024	40.4	1717	67.8		1170	46.1	547	21.6	1717	67.7	
	No	348	13.7	470	18.5	818	32.2	n. s.	481	19.0	337	13.3	818	32.3	**
	Total	1041	41.1	1494	58.9	2535	100.0		1651	65.1	884	34.9	2535	100.0	
Use TM in last 12 months	Yes	469	18.5	665	26.2	1134	44.7		791	31.2	343	13.5	1134	44.7	
	No	572	22.6	829	32.7	1401	55.3	n. s.	860	33.9	541	21.3	1401	55.3	**
	Total	1041	41.1	1494	58.9	2535	100.0		1651	65.1	884	34.9	2535	100.0	
Use Allopathic Medicine in last 12 months	Never	45	1.8	48	1.9	93	3.7		74	2.9	19	0.7	93	3.6	
	Once a month	301	11.8	320	12.6	621	24.4		434	17.1	187	7.4	621	24.5	
	2-3 times a month	364	14.4	470	18.5	834	32.9		508	20.0	326	12.9	834	32.9	
	Once a week	55	2.2	82	3.2	137	5.4	**	68	2.7	69	2.7	137	5.4	**
	3-4 times week	67	2.6	117	4.6	184	7.2		125	4.9	59	2.4	184	7.3	
	Daily	209	8.3	457	18.1	666	26.4		442	17.5	224	8.8	666	26.3	
	Total	1041	41.1	1494	58.9	2535	100.0		1651	65.1	884	34.9	2535	100.0	
Which medical care find less expensive?	Traditional MC	390	15.4	483	19.1	873	34.5		572	22.6	301	11.9	873	34.5	
	Allopathic MC	420	16.6	714	28.1	1134	44.7	**	749	29.5	385	15.2	1134	44.7	n. s.
	Homeopathic MC	231	9.1	297	11.7	528	20.8		330	13.0	198	7.8	528	20.8	
	Total	1041	41.1	1494	58.9	2535	100.0		1651	65.1	884	34.9	2535	100.0	
Which medical care more culturally accepted?	Traditional MC	387	15.3	624	24.6	1011	39.9		699	27.6	312	12.3	1011	39.9	
	Allopathic MC	545	21.5	722	28.5	1267	50.0	n. s.	788	31.1	479	18.9	1267	50.0	*
	Homeopathic MC	109	4.3	148	5.8	257	10.1		164	6.4	93	3.7	257	10.1	
	Total	1041	41.1	1494	58.9	2535	100.0		1651	65.1	884	34.9	2535	100.0	

Chi-square test: *p<.05, **p<.001; n. s. = not significant, MP = Medicinal Plants, TM = Traditional Medicines

Table 4: Perception of the respondents on Medicinal Plants and Traditional Medicines (N=2535)

Categories		Age						p-value	Sex						p-value
		18-35 yrs		36-65 yrs		Total			Male		Female		Total		
		n	%	n	%	n	%		n	%	n	%	n	%	
MP are effective in the treatment of illness	Yes	721	28.5	993	39.2	1714	67.7		1183	46.7	531	20.9	1714	67.6	
	No	62	2.4	43	1.7	105	4.1	**	72	2.8	33	1.4	105	4.2	**
	Don't know	258	10.2	458	18.0	716	28.2		396	15.6	320	12.6	716	28.2	
	Total	1041	41.1	1494	58.9	2535	100.0		1651	65.1	884	34.9	2535	100.0	
TM are effective in the treatment of illness	Yes	489	19.3	762	30.1	1251	49.4		840	33.1	411	16.8	1251	49.9	
	No	108	4.3	82	3.2	190	7.5	**	142	5.6	48	1.9	190	7.5	**
	Don't know	444	17.5	650	25.6	1094	43.1		669	26.4	425	16.2	1094	42.6	
	Total	1041	41.1	1494	58.9	2535	100.0		1651	65.1	884	34.9	2535	100.0	
Use of MP are dangerous to human health	Strongly agree	36	1.4	58	2.3	94	3.7		64	2.5	30	1.2	94	3.7	
	Agree	161	6.4	157	6.2	318	12.6		227	9.0	91	3.6	318	12.6	
	Neutral	407	16.1	709	28.0	1116	44.1		717	28.3	399	15.7	1116	44.0	
	Disagree	272	10.7	389	15.3	661	26.0	**	432	17.0	229	9.0	661	26.0	*
	Strongly disagree	165	6.5	181	7.1	346	13.6		211	8.3	135	5.4	346	13.7	
	Total	1041	41.1	1494	58.9	2535	100.0		1651	65.1	884	34.9	2535	100.0	
Use of TM are dangerous to human health	Strongly agree	39	1.5	78	3.1	117	4.6		81	3.2	36	1.4	117	4.6	
	Agree	106	4.2	82	3.2	188	7.4		124	4.9	64	2.5	188	7.4	
	Neutral	530	20.9	807	31.8	1337	52.7	**	890	35.1	447	17.6	1337	52.7	*
	Disagree	252	9.9	357	14.1	609	24.0		365	14.4	244	9.6	609	24.0	

	Strongly disagree	114	4.6	170	6.7	284	11.3		191	7.5	93	3.8	284	11.3	
	Total	1041	41.1	1494	58.9	2535	100.0		1651	65.1	884	34.9	2535	100.0	
Do you believe that TM is well accepted by the community?	Strongly believe	156	6.2	303	11.9	459	18.1		312	12.3	147	5.8	459	18.1	
	Believe	575	22.7	827	32.6	1402	55.3		925	36.5	477	18.8	1402	55.3	
	Somehow believe	246	9.7	286	11.3	532	21.0	**	321	12.6	211	8.4	532	21.0	*
	Do not believe at all	64	2.5	78	3.1	142	5.6		93	3.7	49	1.9	142	5.6	
	Total	1041	41.1	1494	58.9	2535	100.0		1651	65.1	884	34.9	2535	100.0	

Chi-square test: *p<.05, **p<.001; n. s. = not significant, MP = Medicinal Plants, TM = Traditional Medicines

Table 1 shows the demographic data of the survey respondents in Bangladesh. Results showed from 2535 respondents where 1661 males and 884 females with mean ± SD was 39.07 ± 12.119 years. Statistically significant gender differences among respondents were observed in age, religion, marital status, education, occupation, and health status. Statistically, a significant difference was observed in age by gender, the majority of males (21.3%) belonged to 36-45 years, as were the majority of females (10.5%) belonged to 26-35 years. Though a statistically significant difference was observed in religion by gender, the majority of males (58.0%) were Muslim, as were the majority of females (29.6%). A statistically significant difference was observed in marital status by gender, most males (51.0%) were married, as were most females (27.8%). A significant difference was observed in education by gender, the majority of males (16.7%) and females (12.1%) had an education level up to primary and the second-highest males (14.5%) had an education level were HSC, Diploma, and Vocational. The majority occupation of males (24.0%) was service holder both govt. and private, whereas the majority occupation of females (27.0%) was a housewife. On the other hand, a significant difference was observed in health status by gender, the majority of males (28.3%) had good health status, as did the majority of females (12.8%).

Table 2 shows the knowledge and training on PHC, MP, and TM among respondents. 36.5% of the respondents aged 18-35 years and 44.0% of the respondents aged 35-65 years had knowledge of PHC. On the other hand, more than half (53.7%) of the males and 26.8% females of the respondents had knowledge of PHC. There was no statistically significant in terms of age and training in PHC. Among the respondents' the majority (52.9%) of males and 31.6% females of the respondents had no training on PHC but observed statistically significant differences. There was no statistically significant difference in the idea of MP and TM by age but a significant difference was observed by gender, the majority (37.3%) of males had an idea of MP and TM, whereas females (14.3%). Research showed the statistically significant difference by age between MP and TM is/are essential for PHC, 16.5% and 23.4% of the respondents aged 18-35 years had agreed on this issue. On the other hand, in terms of gender, there was no statistically significant difference.

Table 3 shows the attitudes of respondents on MP and TM in Bangladesh. Among them, 46.1% of males and 21.6% of females of the respondents had used MP in last the twelve months. Of them, one-third (33.9%) of males and 21.3% of females did not use TM in the last twelve months and differ statistically significantly by gender but in terms of age no difference significantly. On the other hand, 14.4% aged 18-35 years and 18.5% aged 36-65 years of the respondents and 20.0% males and 12.9% females of the respondents had used AM at 2-3 times in the last twelve months and the results found statistically significant. Though 16.6% aged 18-35 years and 28.1% aged 36-65 years of the respondents had found that Allopathic medical care is less expensive at the same time 31.1% males and 18.9% females of the respondents had explored that Allopathic medical care is also culturally accepted in social perspective and results are a statistically significant difference.

Table 4 shows the perception of MP and TM from Bangladesh's perspective. Research finds that 28.5% of the aged 18-25 years, 39.2% of those aged 36-65 years, 46.7% of males, and 20.9% of females of the respondents had opined that MP is effective in the treatment of illness. Among them 19.3% aged 18-35 years, 30.1% aged 36-65 years, 33.1% males and 16.8% females of the respondents had also opined that TM is effective in the treatment of illness. Among them 16.1% aged 18-35 years, 28.0% aged 36-65 years, 28.3% males and 15.7% females of the respondents had opined neutral in terms of the use of MP is dangerous to human health. On the other hand, 20.9% of the aged 18-35 years, 31.8% aged 36-65 years, 35.1% of males, and 17.6% females of the respondents had opined neutral in terms of the use of TM is dangerous to human health. Out of all respondents, 22.7% aged 18-35 years, 32.6% aged 36-65 years, 36.5% males, and 18.8% females of the respondents had believed that TM is well accepted by the community. These above-mentioned differences were statistically significant.

Discussions

First of all, the survey was conducted as a cross-sectional study. However, the economic development of Bangladesh recently makes progress remarkably. Therefore, this kind of study should be conducted continuously to confirm precisely the perceptions of MP and TM by the community people in Bangladesh.

To the best of the author's knowledge, this is the first cluster-based study on the use of MP and TM for Primary Health Care (PHC) in Bangladesh. This study showed that elder and male respondents had better impressions of PHC and MP and TM than younger respondents, especially in terms of knowledge and idea. This study also showed that the majority of elder respondents than younger had opined that MP and TM are essential for PHC. On the other hand, MP had more used than TM by the male respondents. However, the study showed that Allopathic Medicine (AM) had used more by elder respondents than by younger and also male than female respondents. The study found that the elder respondents thought that Allopathic Medical Care is less expensive than Traditional and Homeopathic Medical Care and also male respondents opined that it is culturally accepted. On the other hand, the elder respondents opined that the MP and TM are effective in the treatment of illness and this opinion is also preferred by male respondents over females. The study also found that they opined neutral and disagreed with elder than younger and male than female respondents in terms of the use of MP and TM are dangerous to human health. The study showed that the elder than younger and male than female respondents believed that TM is well accepted by the community in Bangladesh with statistically significant differences.

Researchers think that in terms of knowledge of PHC, the idea of MP and TM for PHC, the younger generation of Bangladesh seems to be more skeptical than the elder generation. From the viewpoint of enhancement of usage of MP and TM in Bangladesh, I think that appropriate information should be delivered vigorously in order to remove the skeptical feeling of MP and TM for PHC from younger citizens in Bangladesh. On the other hand, from the viewpoint of gender, there were so great differences among respondents. In addition, elder respondents are more experienced than younger in the attitude and perception of MP and TM.

The research found a policy gap as well as an overlooking approach in natural and Traditional Medicine (TM) in Bangladesh. In Japan, Traditional Medicine is used to treat patients as not only over-the-counter drugs but also ethical drugs covered by universal health insurance.[11, 12] Recently a lot of studies regarding the safety and efficacy of Traditional Medicines have been vigorously conducted.[13, 14] But researcher thinks every kind of information should be delivered, because any kind of scientific data may become one of the strong tools to enhance the usage of Traditional Medicine in Bangladesh as well as Asia and the world as sound evidence. The results of this study confirmed that more Allopathic medicines are familiar and usage of Allopathic medicines was enhanced and improved because of the socio-economic development, open economic market, and change in the medical education policy, as a result, more than a hundred modern medical colleges are established but fail to develop in parallel of natural medical education system.[15, 16] On the other hand, mass media had a negative impact on the promotion of usage of Traditional Medicines (TM) including Medicinal Plants (MP) for Primary Health Care (PHC).

Conclusion

From the viewpoint of effective utilization of limited medical resources, MP and TM should be used appropriately in Bangladesh, Asia, and the world. Therefore, scientifically sound information should be collected rigorously and brought to the respondents vigorously. This may be useful for policymakers, researchers, and development partners to adapt existing healthcare policy in resource-limited contexts. Overall, it will be increased the health coping capacity of people in a resource-poor setting and contribute to their adaptation capabilities. A systematic collection of such knowledge on the use of Medicinal Plants (MP) and Traditional Medicines (TM) could help vulnerable people initiate a directory of the components of Traditional Medicines (TM) used at the community level for specific diseases and sicknesses.

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Conflict of Interest

The authors declare that no conflict of interest existed in the organization, results, presentation, and finance of the research article.

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