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A Novel Analysis of the Relationship Between Caste and Adherence to Medical Treatment

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Abstract

In clinical practice the adherence to medical treatment of patients with regard to their caste has not been well-studied. This study is based on 193 outdoor patients having mean age of 43.65 years (range 18–87 years), median age of 45 years at three government hospitals located next to Islamabad. First the patients considered were asked to answer a 13-item questionnaire concerning the factors that could have affected adherence to the recommended medical treatment. Subsequently, each patient answered the Urdu language version of the Morisky Medical Adherence Scale (MMAS-8) questionnaire. After data preprocessing, the response of each participant was scored to ascertain the adherence to the recommended medical treatment and finally all variables were statistically analyzed. The overall mean MMAS-8 score was 4.55.

The adherence to medical treatment of patients in clinical practice with relation to their caste has not been well researched. This study is based on 193 outdoor patients from three government hospitals near Islamabad; patients having median age of 45 years and a mean age of 43.65 years (range 18–87 years). First, a 13-item questionnaire based on the variables that could have impacted adherence to the prescribed medical therapy was given to the patients under consideration. After that, each patient responded to the Morisky Medical Adherence Scale (MMAS-8) questionnaire in Urdu. Following data preparation, each participant's

response was assessed to determine compliance with the prescribed medical therapy, and all variables were then statistically analyzed. The mean MMAS-8 score across the board was 4.55. Three variables were found to be considerably associated with low adherence i.e. i) number of dependent children ($p = 0.005$) ii) age ($p = 0.02$) and iii) caste ($p = 0.03$) for three major castes of 63 patients. Moreover, patients having higher education appeared to be more adherent as compared to those patients that had no schooling.

Keywords: healthcare, adherence, cast

1. Introduction

In the Indian sub-continent the caste system has been practiced for literally thousands of years. Caste systems are a type of social and economic stratification or governance established on the basis of skin color (varna), occupation, customary rules and rituals. Caste system separates people into social groups (castes) where rights are assigned and fixed by birth, often associated with an occupation and are inherited. By design, in a caste system, there are common information sources, common heroes/villains, and common opportunities that lead to common goals and expectations, common reference groups, common ethics, common behavior and attitudes. This can result in common response to recommended medical treatment resulting in adherence or nonadherence or their selective combination. In this preliminary study, we analyze the impact of caste system on healthcare, more specifically with reference to medical adherence.

Multimorbidity is defined as the simultaneous occurrence of two or more, or three or more chronic diseases; the last definition is more suitable for the classification of patients having complicated health issues (Johnston, Crilly, Black, Prescott, & Mercer, 2019). Adherence is defined as the degree to which a person's conduct, such as taking medicine, keeping a diet, and/or practicing life-style variations is aligned with established recommendations of a healthcare occupation practitioner (Sorensen, Pestka, Brummel, Rehrauer, & Ekstrand, 2016) Appreciation of nonadherence and related problems is vital for developing the correct treatment modalities for corresponding diseases. It is evident that nonadherence will negatively affect the continuing treatment and ignoring this will result in superfluous treatments, incorrect and costly outcomes and even death.

The federal government of Pakistan allocated Rs13.897 billion under the head of Health Affairs for the fiscal year 2018–2019 with major chunk allocated to Hospital Services i.e. 83.9% percent, which amounts to Rs11.657 billion. The point of the matter is that, if the patient doesn't stick to the medications as prescribed, it curbs the efforts being put forth by the government and hence there is the wasting away of tax payer money.

Improving adherence is challenging and is customarily focused on the individual traits, patient behavior, treatment complexity, while social aspects have not been investigated sufficiently (Donovan & Blake, 1992; Vermiere, Hearnshaw, & Van Royen, 2001), traditionally the approach has been health literacy, physician-patient connection (O˘guzülgen, Köktürk, & Is¸ikdo˘gan, 2014; Alghurair, Hughes, Simpson, & Guirguis, 2012) and more. Some studies have discovered a substantially strong association amongst adherence in the social context, w.r.t socioeconomic rank (Takahashi, Ryu, Hathcock, Olson, Bielinski, Cerhan, et al., 2016) and social support (Johnson, Jacobson, Gazmararian, & Blake, 2010; DiMatteo, 2004). Nevertheless, the association between patient's caste encompassing number of social aspects and adherence has not been well-studied. For the patients included in this study, we investigate adherence related factors such as age, number of children, education etc. along with different castes of patients that may lead to adherence or nonadherence.

The area considered in this study is the *Pothohar* region of Punjab that borders Azad Kashmir and the province of Khyber Pakhtunkhwa. The major city of the *Pothohar* region is

Rawalpindi and patients from three major government hospitals of Rawalpindi are covered in this study. The inclusion criteria for this study being patients suffering from chronic conditions and currently on medication while exclusion criteria being patients not currently on any medication. The study was conducted using Urdu language version of eight questions Morisky Medication Adherence Scale (MMAS-8) questionnaire.

Morisky Medication Adherence Scale (MMAS) is the most frequently used metric for empirically quantifying adherence. MMAS is a standard, self-declared, medication-taking-practice metric which was primarily authenticated for hypertension, however, subsequently applied in diverse medical situations (Morisky, Green, & Levine, 1986). MMAS early version consisted of four items/questions, ultimately updated to 8-question and called MMAS-8 as shown in Table 1 (Morisky, Ang, Krousel-Wood, & Ward, 2008). As per MMAS-8 scale, higher points reflect lower adherence to prescribed treatment.

Table 1 MMAS-8 scale.

	Yes	No
1. Do you sometimes forget to take your pills?		
2. People sometimes miss taking their medications for reasons other than forgetting. Thinking over the past two weeks, were there any days when you did not take your medicine?		
3. Have you ever cut back or stopped taking medicine without telling your doctor because you felt worse when you took it?		
4. When you travel or leave home, do you sometimes forget to bring along your medicine?		
5. Did you take all your medicine yesterday?		
6. When you feel like your symptoms are under control do you sometimes stop taking your medicine?		
7. Taking medicine for everyday is a real inconvenience for some people. Do you ever fell hassled about sticking to your treatment plan?		
8. How often do you fell difficulty remembering to take all your medicine?		
		Never/rarely Once in a while Sometimes Usually All the time

Table 2: Factors related to adherence level.

		n	MMAS-8 score	ρ	
Age	≤35	75	4.47	0.021*	
	> 35	125	5.21		
Gender	Female	171	4.9	0.232	
	Male	30	5.41		
Marital status	Married	4.96	150	0.509	Married vs. Single
	Single	4.7	21	0.538	Married vs. Divorced
	Widower	5.25	4	0.324	Single vs. Widower
	Divorced	5.22	26		
Childern	≤ 2	4.43	79	0.00516*	
	> 2	5.32	118		
Work	Employed	4.55	13	0.996	
	Never worked	4.92	113		
Caste	Abbasi	3.86	14	0.035*	Abbas vs. Awan
	Awan	5.04	37	0.044*	Abbasi vs. Rajput
	Rajput	5.35	12	0.617	Awan vs. Rajput

* Statistically significant

2. Methods

2.1 Study Design and Patient Population

In the current study we adopted an observational, illustrative, cross-sectional learning analytics approach that included interviewing and collecting data from patients who visited the outpatient department of three government hospitals in Rawalpindi; which is a twin city of Islamabad; the capital of Pakistan. Informed permission was acquired from all participants before including them in the study. Necessary approval was obtained from the concerned institutional review board before conducting the study.

All participants were asked to answer a 13-item questionnaire vis-à-vis what could have influenced their adherence to the recommended medication? Summary of results is shown in Table 2. Subsequently, each patient answered the Urdu language version of the MMAS-8 questionnaire which was scored by another healthcare practitioner who was unaware of the survey data. 8 The MMAS-8 is a real-world scale comprising of eight yes/no items concerning a person's adherence to recommended medical treatment. As stated before, higher scores mean lower adherence to recommended medical treatment. Several factors which could have influenced adherence to the recommended medical treatment were evaluated as per the MMAS-8 scores, subsequently all factors were statistically evaluated.

2.2 Statistical Analysis

Statistical analysis was performed using the Statistical Package for the Social Sciences version 15.0 (SPSS, Inc., Chicago, IL, USA), graphs were created using public version of Tableau; popular tool for data analytics. The significance of the difference between groups in terms of median values was determined with the Kruskal—Wallis test. A p-value of < 0.05 was considered significant.

3. Results

Figure 1 shows the response of the patients to MMAS-8 question no. 8 with reference to their castes. Other castes reported but not in significant number were *Bhatti*, *Gujjar*, *Malik*, *Raja* and *Pathan* which are not shown in Figure 1. There were 49 patients who belonged to other than the 15 major local castes considered in this study, while 55 patients did not disclosed their caste. Cox et al. (2012) identified families of several minority racial/ethnic groups do encounter reduced interaction in key visit tasks, as compared to White, non-Latino families.

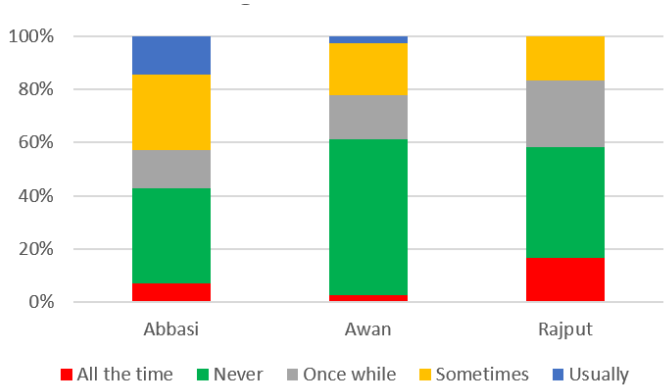

Figure 1. Breakdown of response to Question No. 8 for three major castes of respondents

Figure 1 shows the patient's response to MMAS-8 question no. 8 with reference to their castes. Other caste members who took part in the study but were not in significant number were *Bhatti*, *Gujjar*, *Malik*, *Raja* and *Pathan* and are not shown in Figure 1.

There were 49 patients who belonged to other than the 15 major local castes considered in this study, while 55 patients did not disclosed their caste. There were quite a few ailments and their combinations in addition to different causes for visit the outpatient department such as acid intake, pain in neck, insomnia etc. Figure 2 shows some of the more frequent ailments which are in double digit figure for MMAS-8 questions no. 8.

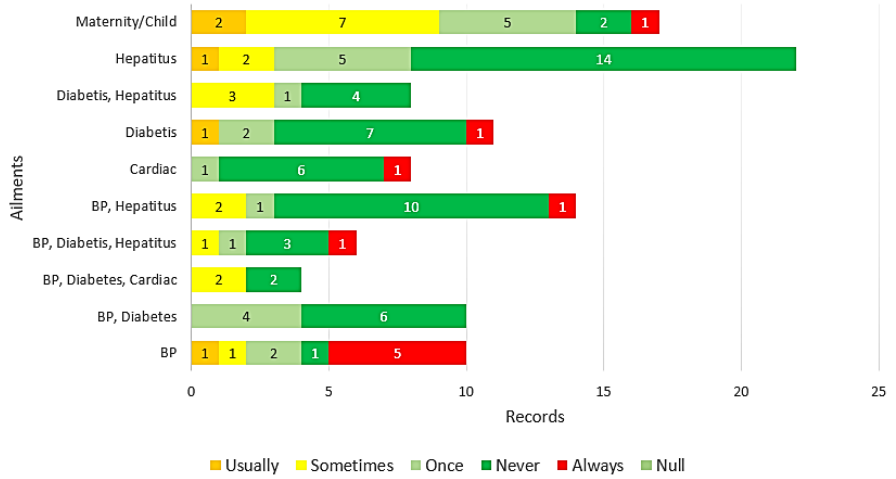

Figure 2. Breakdown of response to Question No. 8 of remembering vs. ailment

The MMAS-8 scores of the factors that could influence adherence are computed and summarized in Table 2. As per these scores, patients above 35 years having more than two dependent children and of local caste showed poor adherence (5.32, 5.32 and 5.35 points, respectively). After statistically evaluating all questions three factors seemed to stand out for low adherence i.e. number of dependent children ($p = 0.00516$), age ($p = 0.021$) and caste ($p = 0.035$). As per our data, patients having more than two dependent children, aged more than 35 years and who belonged to *Rajput* or *Awan* caste were more likely to discontinue their treatment. Contrarily, patients who improved from the treatment, were the ones having less than two dependent children, aged less than 35 years and who belonged to *Abbasi* caste i.e. they were more adherent to the treatment as per MMAS-8 scores (4.43, 4.47 and 3.86 points, respectively). Level of education is another important factor. Moreover, patients having higher education appeared to be more adherent as compared to those patients that had no schooling; shown in Table 3.

4. Discussion

The significance of adherence to recommended treatment cannot be denied and it can affect treatment results. Undoubtly non-adherence will result in protracted treatment, dissatisfied patients, low life quality, and financial burden on the government. It has been reported that 50% plus patients with chronic diseases failed to maintain the recommended treatment (De Geest & Sabate, 2003). Christensen has reported that non-adherence to medical treatments ranged from 20% to 40% in case of acute illness and from 30% to 60% in case of chronic diseases. Furthermore, disconnection rates were up to 80% in case of preventive treatments (Christensen, 2004). As per Osterberg et al. (2021) generally adherence factors can be divided into two categories i.e. modifiable and non-modifiable factors. Modifiable factors could be such as prescribed medication while non-modifiable factors could be in the social context, such as patient's caste.

There are some studies that have established a strong association among adherence and the

social context with regard to social support (Johnson, Jacobson, Gazmararian, & Blake, 2010) and socioeconomic status (Takahashi, Ryu, Hathcock, Olson,Bielinski, Cerhan, et al. (2016). Recently two qualitative studies deduced that neighborhoods influence resident's health by creating a social context that clearly affects their behaviors and beliefs, for example, adherence to recommended treatment (Luz, Loyola Filho, & Lima-Costa, 2011; Conde, Gutie´rrez, Sandı´n, Dı´ez, Borrell, Rivera-Navarro, et al., 2018). Constituents of the social context incorporate the patient's living conditions, such as work, social network, level of education, income level, physical living environment the socio-economic level, and social support (Thomson, Mitchell, & Williams, 2006); this all is encompassed in the caste system.

Centered on this backdrop, we examine the factors that may influence medical adherence. Our data demonstrates that caste is a notable adherence factor and among the three castes considered i.e. *Abbasi*, *Rajput* and *Awan* the patients from the *Abbasi* caste apparently more adherent to the treatment. Our results suggest that the age, number of dependent children and the caste are the three most significant factors related to adherence. We propose organizing the treatment plan with reference to caste, mainly for young patients (≤ 35 years) and having two or more dependent children.

The relationships among the three castes i.e. *Abbasi*, *Rajput* and *Awan* are historically deep-rooted. *Abbasi* is a tribe living in northern Pakistan spread throughout Murree Hills area, Bagh, Poonch District and Kashmir. Although the *Abbasi* tribe/caste tracks its roots all the way to 'Abbas ibn' Abd al-Muttalib and hence known as *Abbasi* (2021), probably the *Abbasi* tribe are descendants of the Abbasid dynasty (2021) who ruled the Middle East during 750–1258 AD (510 years); either way they are not the sons of the soil.

In Sanskrit *Rajput* i.e., raja-putra means the "son of a king". *Rajput* is a large multitude collection of castes, kinfolks, and local groups, having common social rank and beliefs of ancestral descent with roots in the Indian subcontinent (India, Pakistan, Nepal and Bangladesh); sons of the soil. As per modern scholars, almost all *Rajput* clans emanated from pastoral or peasant societies (Eugenia, 2012; David, 1994; Doris, 1993).

Awan, a South Asian Zamindar (land-owner) tribe, presumably of Arab origin, living mostly in central and western parts of Punjab, Pakistan. The *Awans* believe to be the descendants of the fourth Caliph. However, Harikishan Kaul, Arthur Brandreth and Alexander Cunninghamall dispute the Arab origin of *Awans* (Tyagi, 2009). Cunningham considers *Awans* as a *Rajput* clan, Kaul views the Awan tribe as of either Rajput or Jat origin, this being based on Sanskrit in which the term Awan means "defender" or "protector", Kaul asserted that this designation was bestowed by neighboring tribes because *Awans* were successful in defending their strongholds from the raiders.

Table 3 MMA-8 scored according to education level.

Education	MMA-8	n
BA/BSc (16 yrs)	4.82	11
FA/FSc (12 yrs)	4.78	8
Matric (10 yrs)	4.96	27
under matric	4.77	57
no schooling	5.24	85

Education level as per Pakistani education system

From the historical background of the three castes considered, some key differences stand out that also corroborate with the statistical results. The *Abbasi* caste is foreign caste i.e., the caste members do not have their roots in the Indian subcontinent, while Rajput and *Awans* are the local castes. During hundreds of years, invaders breached the Rajput defense that protected the Subcontinent. Some *Rajput* clans like the *Awans* converted during this time, but some clans like the Awans started converting in the early 12th century (2021). This explains the significant statistical difference of adherence for *Abbasi* vs. *Rajput* i.e. foreign vs. local and for *Abbasi* vs. *Awan* castes, again foreign vs. local while insignificant statistical difference for *Rajput* vs. *Awan* castes i.e. local vs. local, as one is a sub-caste of the other.

Haynes et al. (1980) pinpointed more than 250 factors that can impact adherence to prescribed treatment, amongst these factors, age and social seclusion emerged as very significant (Coons, Sheahan,Martin, Hendricks,Robbins, & Johnson, 1994). Elements of the social context are all inclusive of the individual's living environment, such as the physical setting in which they live, income level, socio-economic level, education level, employment, social support and social network (Thomson, Mitchell, & Williams, 2006). Atinga et al. (2016) acknowledged discriminatory access to patient-centered care for in-patients from high and low socioeconomic backgrounds. Our results corroborate with these findings, especially w.r.t caste, as caste stands out as among the vital factors that affect adherence to prescribed treatment.

Shortcomings of our study could be the population size and the likelihood of the dependence among the factors considered. Nevertheless, as stated before, efforts were made to minimize heterogeneity in the study participants. On the contrary, an accurate and independent assessment of each factor needs an extremely standardized group of patients, which would practically decrease the population size. Hence, additional studies with larger population size are required (especially subsequent to COVID) to conduct a more precise adherence assessment.

5. Conclusion

Treating an ailment is a multistep and composite process comprising of suitable medication, timing, patient's overall status, healthcare system and social context. Caste is a dominant factor in the social context, especially in the Indian sub-continent. The members of a caste are characterized by intermarriage, congenital membership, a specific way of life and more.

Persons belonging to a caste have common values, common ideals as compared to members of other castes, members of a caste are expected to behave similarly; including adherence or nonadherence to medical treatment.

There are number factors related to nonadherence that need to be realized for better treatment results and in this regard patients caste has been neglected and not well-studied. Based on the analysis of our data, patients, especially over 35 having two or more dependent children need to be stressed that recommended medical treatment should be properly followed, irrespective of what others in their social circle suggest or practice. Healthcare practitioners should therefore be mindful of caste disparities while dealing with patients of different castes.

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