

Attrition of Knowledge Workforce in Healthcare in Northern parts of India – Health Information Technology as a Plausible Retention Strategy

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Abstract - Faced with a global shortage of skilled health workers due to attrition, countries are struggling to build and maintain an optimum knowledge workforce in healthcare for delivering quality healthcare services. Forces that affect healthcare professional turnover needs to be addressed before a competent uniformly adoptable strategy could be proposed for mitigating the problem. In this study we investigate the effect of the socio-demographic characteristics on attrition of healthcare knowledge workforce in northern parts of India that have a wide gradient of rural and urban belt, taking into account both public and private healthcare organizations.

For this purpose healthcare professional attrition tracking survey (HATS) was designed. The data has been collected from a random sample of 807 respondents consisting of doctors, nurses, paramedics and administrators to explore the relationships between various factors acting as antecedents in affecting the job satisfaction, commitment and intention of a healthcare professional to stay in the job. Structured questionnaires were utilized as the data collection tools. Both public and private healthcare organizations in urban and rural areas were covered for the survey.

Descriptive statistics and factor analyses using analysis on Rotated Factor Matrix using Principal Components Analysis (PCA) in SPSS 16.0 package were carried out. Six factors of attrition namely Compensation and perks, Work Life Balance, Sense of Accomplishment, Work load leading to exhaustion, Need for automation and technology improvement, Break Monotony of Work have been identified as the main factors with a data reliability of 0.809%. Based on the survey response and analysis, a highly possible strategy of utilizing information technology implementation for increasing worker motivation, job satisfaction and commitment to reduce attrition has been proposed.

Index Terms - Healthcare professional, healthcare information technology, attrition Job satisfaction, work-life balance.

1. INTRODUCTION

Health care industry relies a lot on advanced medical technology, but it is also a labor-intensive industry. In recent times there has been increase in healthcare costs and healthcare

staff shortages leading to healthcare organizations undergoing changes [1,2]. Some of these changes have led to increased performance expectations and efficiency leading to decrease in staff morale and increase in attrition[3-5]. In this paper, the terms “health care professionals” and “human resources for health” are used interchangeably, comprise of doctors, nurses, paramedics, hospital administrators. Researchers have identified the effect of shortage of skilled workers in hospitals lead to high patient mortality, job dissatisfaction and burnout[6, 7]. The migration of health professionals has been debated to be one of the main reasons of attrition and has been the main focus of such studies [8, 9]. It has been argued that opportunities for professional training, higher salaries and perks and better living conditions act as “pull” factors, surplus production of health personnel, resultant unemployment, less attractive salary, stagnation or underemployment coupled with lack of infrastructure act as “push” factors for the youth to migrate. A number of strategies have been discussed to counteract migration [8-11]. Human resources management plays a significant role in retaining health care workers [12].

Health care industry relies a lot on advanced medical technology, but it is also a labour-intensive industry. As the Indian healthcare industry experiences phenomenal growth, hospitals are moving forward towards excellence rather than survival and gearing up to fulfil the gaps in three key areas of people, process and technology. India is the one of the most populous country with larger population in rural areas[13] with an estimated 27.5% of Indians still living below the poverty line and cannot afford the healthcare provided by private organizations due to cost and unreachable locations. Most of them utilize the public healthcare provided by the government organizations. In a recent survey of dichotomy existing in the utilization of private and public health services in India it emerged that a bias towards the use of private health services in spite of the earlier mentioned problems may be due to the view that public healthcare services are not of good quality[14].

Even with greater number of health care professionals viz, doctors, nurses, pharmacists, paramedics getting trained the Indian healthcare sector is suffering from acute shortage of healthcare professionals and facilities delivering quality healthcare services to the citizens[15]. According to survey carried out in 2008-09, India has only around 85,000 doctors practicing modern medicine and 1.5 million nurses to serve its more than one billion population. It has 0.8 beds/ 1000 population, and 0.6 doctors / 1000 population (lowest in the world). This means 6 doctors per 10,000 patients with a doctor/ nurse ratio of 0.83 compared to china having 20. This

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large disparity has indicates a high attrition of knowledge workers in healthcare.

Implementation and utilization of information technology in healthcare (commonly identified as Health Information Technology or HIT) has proven to be of immense benefit like, improved patient care, reduced waste and inefficiency in services, reduction in adverse drug effects and medical errors etc [16-18]. Since healthcare professional job satisfaction also has important implications for quality healthcare delivery, the relationship between the use of HIT and physician career satisfaction should be probed. In an earlier small scaled study [19] it was determined that using more information technology was the strongest positive determinant of physicians' being very satisfied with their careers.

India has joined the bandwagon of information technology adaptors and is one of the main global forerunners in this area[20,21]. A number of government policies and programs have been developed pertaining to use of healthcare information technology (HIT) to improve the quality of healthcare delivery [22,23]. Major private hospitals (corporate) and public hospitals at state level have implemented hospital information systems for patient management, employee management, inventory, pharmacy, laboratory etc, [24,25]. While there are articles that indicate there is greater danger of brain drain in the area of healthcare in India, there are no detailed studies that offer effective retention strategies for reducing the attrition in Indian scenario.

The aim of this paper is to develop a probable strategy that could use implementation of information technology as a probable strategy to reduce attrition. To achieve this objective, we use the data collected from doctors, nurses, paramedics and administrators form different public and private organizations both in rural and urban area. This is in contrast to the earlier studies where the sample belongs to homogenous groups or to identical location of work.

2. MATERIALS AND METHODS

Data for this study came from the second round of the Healthcare Attrition Tracking Survey (HATS). HATS is a part of the multi-level study of the ongoing doctoral research program conducted to address these issues regarding attrition among healthcare professionals and to determine if implementation of Health Information Technology in hospitals and healthcare centres can work as an effective retention strategy in India. HATS was conducted among a non homogeneous group of skilled healthcare professionals such as doctors, paramedics, administrative and managerial staff in public as well as private hospitals covering rural and urban regions of Northern India. The survey was designed based on a non-formal discussion with nearly 40 healthcare professionals who had participated in the International Conference on Medical Informatics held by Indian Association for Medical informatics (IAMI) in Hyderabad, India (Nov. 2009).

In the first round pre-test studies were conducted in five hospitals (minimum 100 beaded) one each from the five states

of Delhi, Haryana, Uttar Pradesh, Madhya Pradesh and Jammu and Kashmir. This was followed by focus group discussions. Based on the results obtained from these an elaborate second round of data collection using a complex sampling design of 40 Hospitals randomly selected to yield a non-biased representative sample of healthcare workforce both in rural and urban areas led to the present paper. Out of the 2000 respondents approached for the survey, data was collected from 807 respondents using the questionnaire tool developed by the authors and reviewed by the experts in the field. The major challenge faced was in obtaining the permission from the HR authorities to conduct the survey due to issues of transparency of the system and HR policies.

Each participant was screened to determine survey eligibility based on the following criteria before filling the questionnaire:

Criteria 1 (origin): Health care professionals should be of Indian origin. **Criteria 2** (Completion of Training): Respondents should have completed their training and licensed in India. **Criteria 3** (Job Satisfaction): Respondents were initially questioned regarding their view on current job satisfaction. Those who responded “don't know” or “refuse to answer” were excluded from the HATS survey.

The selected respondents were provided questionnaire that contained 60 questions that could provide insight to their job satisfaction, work environment, self development, supervisor relationship, reasons for leaving job, future plan, their practical knowledge, attitude and usage of HIT. The responses were recorded on a five-point Likert scale from 1 (strongly agree) to 5 (strongly disagree), yes/ no option and as open – ended for inviting their views.

Statistical Analysis: A random 5% sample of responses was checked for coding errors. Wherever the data was left uncompleted and unclear the respondents were approached individually to recollect the data. The Reliability Test on Data was 0.809%. Data were analyzed by means of Factor Analysis on Rotated Factor Matrix using Principal Components Analysis (PCA) in SPSS 16.0 package to determine the relationships between factors influencing attrition. Descriptive statistics included percentage rates for categorical variables, means and standard deviations. The categorical variables considered were gender, marital status, age, education, work nature, location, organization type, work experience and income. Chi-square tests to find the associations between the reasons indicated for leaving a job and the number of respondents and t-tests to compare the contribution of each categorical variable on the forces of attrition were performed. Descriptive statistics were performed to analyze the knowledge, usage and the type of HIT used by the respondents.

3. RESULTS

The sample was predominantly male and the proportion ranged $57.6 \pm 0.5\%$. The respondents were mostly middle-aged (52.1%) in the range 26 to 35 years and mostly married (62.4%) living with family. Nearly 20% of the married

respondents especially male were living alone with their family in their respective home towns. Almost two-thirds of the participants were doctors, paramedics, nurses, administrators who had less than a year of practice in the current organization and also middle-aged. 54.7% of the participants were graduates while the postgraduates were 34.5%. Undergraduates were few (11.6%). Approximately nearly equal number of doctors and nurses, paramedics participated while the administrators were less. There was not much difference in the number of participants based on their income.

During the survey it was identified that many respondents had shifted job within a year and some have decided to do so within short period of time. Through open ended questions the reasons for shifting and their future plan to shift were ascertained (**Fig. 1**). The effect of socio-demographic details on the responses were calculated and plotted in graphs. Chi-test was performed to ascertain the significance of these on migration.

It was observed that gender, age, marital status, nature of the work profile, work experience and wage to have significance with respect to the reasons for shifting job. The three main reasons identified were heavy work load, no social benefits and low pay structure. The distribution of the salary drawn by the respondents had greater significance with the reasons identified than other variables. Non-cooperative boss and frequent transfers were also identified.

The factor analysis on Rotated Factor Matrix has led to 6 Factors of attrition as under:

Factor 1: Compensation and Perks

Factor 2 : Work Life Balance

Factor 3 : Sense of Accomplishment

Factor 4 : Work load leading to Exhaustion

Factor 5: Need for Automation and technology Improvement

Factor 6 : Monotony of Work.

All the above six factors were compared with the 9 descriptive parameters indicated in **Table I**. Only those that had a significance effect on the forces of attrition are described in detail in this paper. Gender, marital status, age and education did not contribute much. Time spent by a healthcare professional at an organization does contribute to the attrition. Two factors namely how the organization contributes to the work – personal life and extent of the work load seem to be the major contributors.

Stress due to over workload was the main contributor when type of the healthcare organizations ie. private versus public was considered. Nature of the work of the respondents considered seems to throw significant contributions to attrition. Nearly 4 out of the 6 factors were affected. All the four factors namely, Compensation and Perks, Work -Life balance, Sense of accomplishment and Need for Automation and Technology all were significant at 0.01 level (**Table II**).

Irrespective of the salary package five out of the six factors of attrition identified were significantly found to contribute to attrition. Compensation and Perks need for implementing

automation and technology all contributing to job satisfaction in terms of sense of accomplishment seem to be major affecting factors (**Table III**).

The proportion of respondents proposing to shift the existing job within next few years was further investigated. The doctors were more prone to shift jobs compared to others (**Fig.2**). It was determined the proportion of those who did not plan to change jobs in near future were more than those who had planned to shift within near future. The male health professionals especially those who were married and health professionals with low income packages were very much keen to change jobs. Also middle aged professionals were keener to shift with job satisfaction and salary being indicated as the prime reasons.

The respondents were also tracked regarding their usage of HIT in order to determine their awareness and willingness to adopt HIT to increase the job efficiency (**Fig 3**). It was also observed that health professionals within minimum postgraduate education and those who were middle aged had greater computer awareness.

4. DISCUSSION

Results show a significant difference in attitudes towards factors affecting attrition. The results provide evidence to demonstrate that economic motivation as a factor for changing jobs is not an independent, stand-alone factor in itself, but rather a component of broader factors that takes into consideration the yearning to improvise both developments in both professional and personal front.

The respondents were further questioned to ascertain the need of HIT in their work and their willingness to undergo further IT training. 80% of the respondents felt the need of implementing HIT to simplify their work and almost all of them were ready to undergo training with overall percentage of 60% respondents being favourable.

This finding is a departure from the previous studies that indicate the intention of healthcare professionals to frequently change jobs and migration to foreign countries are mainly dependent on remuneration [26,27].

Based on a broader framework of understanding derived from the results of this study, a number of inferences can be drawn relating to strategies to encourage retention.

Factor 1 Compensation and perks that refers to providing incentives and extra income in terms of benefits need to be structured through contested policies of public and health sector reforms that would induce the health care workers to continue in the existing organization [11].

Factor 2 Work life balance depends on the nature of the work, type of the workplace and issues in the workplace. Introducing strategies like flexible work options, specialized leave policies, paid maternal leave, paternal leave, etc. can increase the satisfaction level of the healthcare professionals. Doctors and administrators who spend greater time of the day in the hospital are affected by work life balance issues.

Factor 3(Sense of accomplishment) is about job satisfaction felt by the healthcare workers. This does not depend upon the

monetary issues and it deals with the sense of achievement and fulfilment felt by the employees. A key to build such a culture is by involving the medical staff members to make collaborative decisions in clinical and operational issues[28].

Factor 4 (Work load leading to exhaustion) and **Factor 6** (Break monotony of Work) refers to the overworked health care professionals. While this was not much of the problem in urban hospitals interviewed, it was more prominent in the rural areas. This is due to higher workloads, coverage of large geographic areas, lower access to specialists, and to a broad array of patients. This specifies the need to improve working conditions and the professional interface with other health professionals and society in the rural areas. Planned interventions could employ non-financial incentives such as recognition by management, performance review and improving inter-professional working relationships, to uphold and strengthen the professional ethos of health professionals [29].

Factor 5 (Need for Automation and Technology Improvement) implies the requirement of HIT implementation in the health care industry. The supply of good support, education and training is a key approach to attracting and retaining allied health practitioners, especially in rural locations[12,30]. HIT enables health care professionals to confidently access, interpret, and apply organisational knowledge, patient care procedures, professional workforce competencies, best practice knowledge and other skills information in a manner that improves patient satisfaction, achieves positive clinical outcomes, and maximises cost savings for the organisation [18,19]. In this present study irrespective of gender, age & education, location the importance of implementing HIT was stressed by almost all respondents. The nature of work done by respondents seems to play a significant role in assigning the need for automation and technology as a major factor of attrition. The doctors seemed to be the preferred users of computers, than the healthcare administrators and the nurses and paramedics. Also it was identified that the HIT usage was more prevalent in urban hospitals than in rural hospitals. Moreover, the difference in the salary does not seem to detract the fact that implementation of HIT was seen as a basic requirement of healthcare professionals.

Based on the discussions with the respondents it was understood that the healthcare professionals leave their jobs due to the greater job opportunities and higher pay packages in abroad. Attrition of post graduate doctors is seen to be in lure of attractive salary packages, better technologically equipped healthcare facilities besides higher studies. Medical professionals working in rural private health set ups found reasons for leaving their job in search of opportunities that not only provides good financial benefits but also better professional development through adoption of newer technologies. Given the industry standard salary, they still were ready to shift jobs to organizations that were endowed with advanced technologies of healthcare delivery.

Based on the observation the following it can be understood that for any hospital and health care system the planning of manpower (human resources) is very vital[31]. Detailed planning of human resources and a plan of action for their selection, training and deployment are very important factors to be considered right from the project planning to implementation and should be undertaken at the inception of the project.

Other than better salary packages and financial benefits, better work environment etc implementing HIT to reduce work load stress, enrich knowledge and core specialization, improve quality in service can work as an ideal strategy to increase job satisfaction of healthcare professionals thereby reducing attrition. This also reduces medical errors and increases quality in healthcare delivery [18,32]. Healthcare is rapidly becoming an interconnected ecosystem, with IT as its circulatory system. While the above strategies can be uniformly followed among all healthcare professionals irrespective of their nature of work and location the following guidelines may be followed especially in India. Since all the processes of recruitment and selection are critical and attrition rate of knowledge workers in Healthcare is significant, the healthcare industry should focus on employing right talent and develop the talent to increase retention in the organization for a longer period of time.

A potential solution to bridge acute shortage of healthcare workers and reduce attrition rate is through providing accessibility to online healthcare, which has emerged as very important tool for offering healthcare services that can be accessed by patients across boundaries. Online healthcare connects patients and doctors via internet services. Online health portals can reduce workload and streamline processes for consultations, booking appointments, maintaining patient health records, getting second opinions, among various other services offered.

Healthcare professionals must be provided financial help and resources to further their knowledge in the realm of HIT, mandatory practical exposure to using computer and internet etc. They should be offered incentives to encourage them to use the technologies implemented. They should be made aware of the benefits that would increase by using computers to reduce their work load, increase quality of service etc. They should also be trained to use the technology to learn about guidelines, surf medical and health databases to retrieve vital information, to retrieve information from journals, e-books, to keep in touch with professional groups etc. Training should be provided to them to reduce the fear of increase in work complexity through the use of technology.

Implementation of Technology and adoption of Healthcare Information Technology applications and best practices would result in simplifying processes. The benefits would be in terms of Unique Health Identification Number (UHID) for each patients, Electronic Medical Record (EMR), Telemedicine, Reduction in Physician Errors, Time Savings in processes such as information retrieval, Adoption of International Standards and best practices, Instant Availability of Administrative Data,

increased Financial Savings and Clinical Trials & Research. This in turn would bring in transparency in the system and healthier working conditions. Improved efficiency and profitability would lead to better employee compensation and working condition thereby leading to retention of knowledge workers in healthcare.

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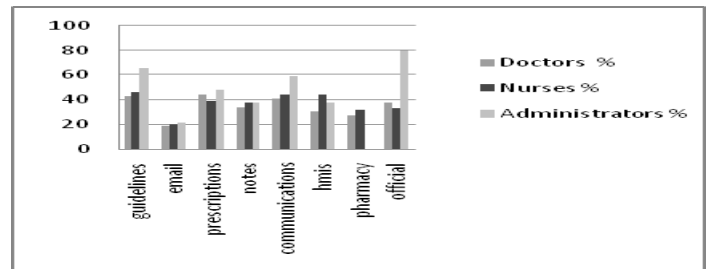
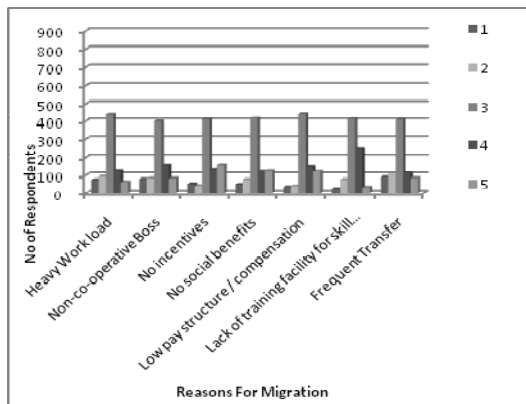


Figure 3: Proportions of Respondents using IT

TABLE I Demographic details of the respondents

		N=807	
1	Gender		
	Male	57.6%	(461)
	Female	43.2%	(346)
2	Age		
	17-25	18.7%	(150)
	26-35	52.1%	(417)
	36+	30%	(240)
3	Marital Status		
	Married	62.4%	(499)
	Unmarried	38.4%	(307)
4	Work Experience		
	< 5 years	76.1%	(609)
	> 5 years	24.7%	(198)
5	Education		
	undergraduate	11.6%	(93)
	graduate	54.7%	(438)
	postgraduate	34.5%	(276)
6	Nature of Work		
	Doctors	38.9%	(312)
	Nurses & paramedics	37.1%	(297)
	Administrators	24.7%	(198)
7	Income (Rs)		
	upto 10,000	20.5%	(164)
	10,000-20,000	18.9%	(151)
	20,000-30,000	26.6%	(213)
	30,000-40,000	16.6%	(133)
	>40,000	17.9%	(143)
8	Type of Hospital		
	Public	39.2%	(316)
	Private	60.8%	(491)
9	Location of Hospital		
	Urban	72.6%	(586)
	Rural	27.4%	(221)

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1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree

Figure 1: Reasons provided for shifting jobs within last 1 year

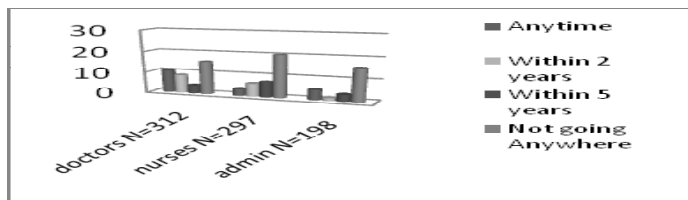


Figure 2: Proportions of Respondents planning to shift jobs