

**Original article:**

**Examining the relationship between living conditions, work environment and intent to stay among nurses in current posts in rural areas of Odisha state, India**

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**Abstract:**

**Objectives :** The scarcity of nursing workforce in rural and underserved areas are key challenges for healthcare systems across the countries. Such inequities have not only impede quality care but also an impact to population health outcomes especially in developing countries. An understanding about nurses' retention and attrition are crucial to inform policy and decision makers for improved rural retention among nursing workforce. The aim of the study was to examine the relationship between living conditions, work environment and intent to stay in current posts of work; and the associated factors influencing intent to stay in current posts of work among nurses in rural areas of Odisha state, India. **Methods :** A cross sectional survey was conducted among 232 nurses from October 2016 to February 2017. Multistage sampling technique was used to select the study subjects from rural hospitals. Data were collected using structured self-administered questionnaires. Descriptive statistics were computed to summarize the basic characteristics of study sample. Logistic regression model was fitted and odds ratio with 95% of confidence interval was calculated to identify associated factors. **Results:** The proportion of a nurse's intent to stay and continue working in rural areas for next 3 years was 73.7%. There was a positive correlation between intention to stay with the living conditions and work environment. Logistic regression shown that age (OR=0.95, 95% CI = 0.89 - 0.98,  $P = 0.047$ ), living conditions (OR = 1.13, 95% CI = 1.04 - 1.22,  $P=0.009$ ) and work environment (OR = 1.07, 95% CI = 1.01 - 1.14,  $P = 0.015$ ) were the significant predictors that are associated with intent to stay in rural areas among the nursing profession. **Conclusion -** Improving living conditions and creating a culture of supportive work environment among the nursing community in rural areas can create increased retention in the workforce.

**Keywords:** Intent to stay; rural areas, living condition; work environment; nurses; Odisha; India.

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**Introduction**

The global scarcity of nurse impedes health service delivery and has become a challenge for nurse administrators to maintain population health across the globe. Research evidence illustrates that adequacy of human resources for health is a critical component of health systems<sup>1-3</sup>. There is also an unequal distribution of health workforce in urban

vs rural areas in most of countries<sup>4</sup>. It is generally accepted that nurses are backbone of health systems, engaging in the provision of about 90% of the direct patient care<sup>5</sup>; yet the global shortages of nursing workforce still continues<sup>6</sup>.

It is obvious that the rural inhabitants receive less health care than of urban most locations<sup>7</sup>. The World Health Organization (WHO) describes human

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resources as an important 'building block in a health systems framework'<sup>1</sup>. Despite this, human resources remain a neglected issues of health systems as a result WHO reported only 38% of global physician workforce and 25% of the nursing workforce serve about over half of the world's population that reside in rural areas. Such disparity in nursing workforce distribution leads to poor health outcomes and increase the global burden of disease<sup>8</sup>.

To efficiently solve the shortage of nursing workforce, our efforts should focus on the improvement of living conditions and work environment in rural and underserved areas. Fostering decent living conditions and a supportive work environment are crucial needs for rural areas, because living conditions and work situations present severe challenges<sup>1</sup>. Understanding the factors that impact retention or job turnover in remote and rural areas might offer possible approaches to nursing shortage. In many parts of the world, improvement in living conditions and the supportive work environment is key to retain nurses in underserved areas<sup>7</sup>. The assessment of perception of nurses towards their living conditions and work environment is important while engaging with issues related to nurse retention in rural and remote areas. Therefore, the current study examines (1) the relationship between living condition, work environment and intention to stay in the current post of work; and (2) the factors associated with the intention to stay among nurses in rural areas in Odisha.

### **Context of India with Specific Emphasis to Odisha State**

The World Health Report 2006 identified India as one with momentous scarcity of skilled health workers<sup>1</sup>. Of late, the Indian government has made significant efforts to address the workforce shortage through its centrally funded program named National Rural Health Mission (NRHM) in 2005, which is currently known as the National Health Mission (NHM). Under NHM, the state governments have introduced various policies and invested on health infrastructure to attract and motivate medical workers to work in rural and remote areas<sup>9-14</sup>. Some of the key initiatives are contractual recruitment of medial work force as per NHM guidelines, to complement state government's sanctioned post<sup>1</sup> and to increase health workforce in rural areas. The 2010 government's annual report to the people on health, indicates that there is severe shortage of nurses in the country<sup>15</sup>. Crucial factors mentioned in this paucity

were uneven sharing of nursing and medical schools across the country, dearth of health workforce due to international migration, choice of working in city areas, less government sanctioned post in rural hospitals and staff retirements are not replaced over prolong periods of time.

Further, the nurse to population ratio was 17.1 per 10,000 population in India during 2006-2013<sup>16</sup> which is very low as compare to the high income nations, where the average nurse to population ratio was 86.9 nurses per 10,000 population in the same period<sup>16</sup>. In some developing countries such as Thailand and Malaysia had 20.8 and 32.8 nurses per 10,000 population in 2006-13<sup>16</sup>. The grim nursing forecast in India as reported by High Power Committee on Nursing and Nursing Profession constituted in 1989 by the India government's mentioned that 'long working hours, inadequate work place environment, lack of supplies and equipment, forced performance of non-nursing duties' were major issues for the nurses of India<sup>17</sup>. Moreover, Indian nurses suffer from low salary, lack of professional autonomy, prestige and unsupportive work attitude<sup>18</sup>.

Most of the research in India stated the attitudes of medical students and in-service health workers towards rural service, and the predicting factors that influence at individual level for retaining health workers in rural areas<sup>11,13</sup>. These studies identify individual factors such as rural upbringing, education facility for children, professional development, personal values of services and staying with spouses can influence medical workers decision to stay in rural areas. Further, less salary, infrastructure shortage in rural areas and poor management are some of the major challenges in remote and rural areas<sup>11,13</sup>. The present study examines the perception of nurses on their living conditions and work environment and the influence of such variables towards intent to stay in rural areas. This would support the policy makers and nurse administrators to device feasible strategies that can promote increase in nurse retention in underserved locations.

This study was located in Odisha state of India. Odisha is the 11<sup>th</sup> (of 28) largest state in India by population, and is situated in the east along the Bay of Bengal. Odisha is documented to be poorest state in the country and government of India is formally designated as a 'backward state', - a state that it allows preferential treatment for various welfare schemes of government. There are 30 districts of Odisha, out of which 11 districts of south region

are named as KBK+ (i.e. the districts of Rayagada, Nabarangpur, Khandamal, Boudh, Gajapati, Koraput, Nuapada, Bolangir, Kalahandi, Makangiri and Sonepur) and another 19 districts is named as non-KBK + (i.e. the districts of Angul, Bargarh, Balesore, Cuttack, Deogarh, Bhadrak, Jajpur, Ganjam, Khordha, Dhenkanal, Jharsuguda, Puri, Sambalpur, Jagatsingpur, Keonjhar, Sundergarh, Kendrapara, Mayurbhanj and Nayagarh). The 11 KBK + south districts are largely populous with indigenous communities (namely 'adivasis' and/or tribal), interior of the district is mountainous, have historically deprived economy and poor health indicators, poor access to transport facilities that hinders health care delivery and extremely food insecure than non KBK + districts<sup>19</sup>. The availability of nurses in the state is also very low. The densities of nurse in Odisha are about 0.64 per 10,000 population. One nurse is catering to a population of 15,000 in the state; there are 13 districts in which a single nurse is catering to a population of more than 15,000<sup>20</sup>. In addition, some of the health system challenges that Odisha face is recruitment of health workers and their retention in rural and remote areas. These unique challenges are also faced by other states and reasons for it are less understood.

Also, the current living conditions and work environment of Odisha nurses in rural and remote areas are not so good. The daily living conditions or social determinants of health such as water, housing, electricity and transportation facilities in remote and rural areas remain challenges for nurses. Especially, lack of government quarters is seen as obstruct to rural service. Although new government quarters are being constructed under NHM in Odisha, but these quarters are not enough for staff members. Finding rented accommodation is difficult in nearby health facilities. Moreover, safety is another concern among nurses in remote and underserved locations affected by insurgency. Nurses working in insurgency affected areas are being threatened by insurgency groups and sometimes they demand for money and other belongings. In work environment, the absence of ambulances, clinical infrastructure, drugs and equipment is seen as an issue. There is an inadequacy and irregularity of supply of drugs and equipment's to rural health posts. Sometimes, nurses has to handle bleeding patients in bare hand in the absence of hand gloves. In addition, lack supportive staffs in rural and remote areas exacerbate the burden of work on their shoulders<sup>20</sup>.

## Methods and Sampling

The study approaches cross-sectional survey of nurses working in rural health facilities in Odisha state. Each districts of Odisha have three-tier health structure: primary health centres at the village level (for 30,000 population), community health centres at the administrative block level (for 100,000 population), district hospitals (DH) and sub-divisional hospitals (SDH) at district levels (for 1.3 million population). Both PHCs and CHCs cater primary health care in rural areas while SDH and DH provide specialist services in urban areas.

This study used multistage sampling procedure to select nurses working in PHCs and CHCs were briefly mentioned. At the first stage, six districts were randomly selected, each three from KBK+ (i.e. districts of Bolangir, Koraput and Kalahandi) and non-KBK+ (i.e. districts of Bargarh, Dhenkanal and Balasore) regions. At the second stage, proportionate sampling procedure was adapted where the estimated sample was calculated based on the real estimation of nurses working in PHCs and CHCs. The third stage includes sample random sampling to select sampled nurses from each district. According to the data from the Chief District Medical Office of the six sampled districts, the total nurse working in PHCs and CHCs were 387 (Bargarh = 62; Balasore = 84; Dhenkanal = 61; Bolangir = 53; Koraput = 71 & Kalahandi = 56). Due to shortage of nurses in rural hospitals and discussion with Department of Health and Family Welfare (DOHFW), Government of Odisha, it was planned to interview 60% of study sample with the inclusion of 10% for possibility of non-response rate. Thus, the estimated final sample size was 255. The data collection was carried out from October 2016 to February 2017.

## Research instruments

Data were collected through using a self-administered structured questionnaire. The questionnaire comprised of three parts.

Part I: General characteristics of nurses developed by the researchers that include age, gender, marital status, religion and time travel (one way) to workplace.

Part II: Living conditions and work environment satisfaction among nurses which contain 10 items (4 items for living condition and 6 items for work environment). These items were developed after investing the conditions of Odisha nurse. Response options in this study was rated from 1 (least satisfied) to 5 (very satisfied). The living conditions and work

environment satisfaction inventories were evaluated in a five point (number from 1-5) scale that ranged from “very dissatisfactory” to “very satisfactory”, where in “1” represents very dissatisfactory, “2” represents dissatisfactory, “3” represents moderate (not too bad), “4” represents satisfactory, and “5” represents very satisfied. The overall Cronbach’s alpha coefficient for living condition satisfaction scale and for the work environment satisfaction scale was 0.76.

### Part III: Intent to stay among nurses in rural areas

For the purpose of this study intent to stay was defined as the desire to continue working in rural areas for at least next 3 years’. Thus, one question “Do you intend to stay and continue to work in rural areas for at least next 3 years?” was constructed to measure intention to stay. This question was asked to each nurses. They replied with “Yes” or “No” to the statement. A value 1 was set for nurses who was said “yes” and 0 for those who said “No”.

### Data quality assurance

The quality of the data was controlled by imparting appropriate trainings and supervisions for data collectors. The principal supervisor was leading the overall supervision of the data. Pretesting of the questionnaire was done among 30 nurses that work in outside research study area. The pretest result was analyzed and appropriate corrections were made on the living condition and work environment inventories before the actual collection of data start.

### Data processing and analysis

The data were thoroughly checked, entered and analyzed using Statistical Package for Social Science (SPSS) version 18. Univariate descriptive statistics was used to describe the socio-demographic profile of the study subjects. Then, the Spearman rank correlation coefficient was used to assess the relationship between intention to stay with living conditions and work environment satisfaction. Finally, logistic regression was computed to see the association between the independent and the dependent variables. Odds ratio with 95% of confidence interval was used to identify strength of association between dependent and independent variables. P-values of equal or less than 0.05 were considered as statistical significant.

### Ethical approval

The study was approved by the Institutional Review Board of Mahidol University, Bangkok. The study

plan was also presented to the research and ethics committee of Department of Health and Family Welfare (DOHFW), government of Odisha, and the committee gave permission for the research. The research goals were explained to nurses before collecting the data. Written consent was obtained and confidentiality was strictly maintained throughout the study. It was told to participants that their involvement in this study was voluntary. They can quit at any point of time without any restriction if they were unwilling to participate this study.

## Results

### General characteristics of study participants

There were 255 nurses approached to participate in the study, 232 returned the questionnaire, yielding a response rate of 90.9%. The mean age of nurses was 34.8 (SD = 9.3) years and the mean years of work experience was 7.1 (SD=6.6) years. Majority of the participants were female (93.5%) and were married (66.8%). Approximately 79.7% of the respondents were from Hindu community and 83.6% of respondents took less than 30 minutes to reach at their work place (one way). The general characteristics of nurses are given in table 1.

**Table 1: General characteristics of nurses (n = 232)**

Variable	Mean (SD)
Age	34.8 (9.3)
Total work experience in rural areas (Years)	7.1(6.6)
Variable	Number (%)
Gender	
Male	15 (6.5)
Female	217 (93.5)
Marital status	
Single	77 (33.2)
Married	155 (66.8)
Religion	
Hindu	185 (79.7)
Others	47 (20.3)
Time travel (one way) to workplace	
More than 1 hour	13 (5.6)
30-60 minutes	25 (10.8)
Less than 30 minutes	194 (83.6)
Intention to stay and continue working in rural areas for next 3 years	
No	61 (26.3)
Yes	171 (73.7)

SD = Standard deviation

**Intention to stay of nurses**

The investigated participants of this study showed that 73.7% nurses intent to stay and continue to work in rural areas for next 3 years.

**Mean score of living condition and work environment satisfaction**

The results of living conditions score indicated that nurses were moderately satisfied with first three items and least satisfied with the last item asked to them (See table 2). They mentioned moderately satisfied with the amenities and infrastructure (water, telephones, internet etc.) available in their current place of stay (1.79±0.652), satisfaction with the housing allocated them from government (1.63±0.812) and satisfaction with the availability schools or childcare facilities in the area where they work (1.72±0.768). However, nurses were least satisfied with the prospects of employment for their spouse in the area where they work (1.20±0.978). In work environment degree scores, nurses were found satisfactory with the adequacy of support services (such as clerks, patient, transport, personal etc.) provided to them for quality care of the patients (2.14±0.637), the adequacy of time and opportunity to discuss patient care problems with more experienced nurses or those working in other disciplines (2.22±0.644), the adequacy of medical supplies, drugs and up-to-date equipment to provide quality patient care (2.24±0.534), getting regular suggestions and support from colleagues/ seniors working in urban areas for extending better health services through personal/team visits or through tele-health (distance based technology) to improve knowledge and skills (2.13±0.669). In other items such as satisfaction with accessibility to any professional network, rural health professional associations that consist of nurse working in rural areas, nurses found moderately satisfied (1.72±0.675) and they mentioned least satisfied with any award or recognition while working in rural areas (1.45±0.601).

The mean score of living condition satisfaction and work environment were presented in table 2 and table 3. A score of more than 2 were classified as the “satisfactory” group. A score of “1.5-2” represented moderate (not too bad); the rest (e.g., < 1.5) were “dissatisfactory”.

**Table 2: Living conditions satisfaction degree among nurses (n = 232)**

Items	Dissatisfied n (%)	Moderate/ not too bad n (%)	Satisfied n (%)	Mean±SD
1. Satisfaction with the amenities and infrastructure (water, telephones, internet etc.) available in the current place of stay	78 (33.6)	124 (53.4)	30 (12.9)	1.79±0.652
2. Satisfaction with the housing allocated to you from government*	85 (36.6)	98 (42.2)	32 (13.8)	1.63±0.812
3. Satisfaction with the availability of schools or childcare in the current place posting*	73 (31.5)	114 (49.1)	33 (14.2)	1.72±0.768
4. Satisfaction with the prospects for employment for your spouse in the current place of postings*	77 (33.2)	63 (27.2)	25 (10.8)	1.20±0.978

\*Item no 2, 17 participants indicated Not Applicable (NA) \*Item no 3, 12 participants indicated NA\*Item no 4, 67 participants indicated NA.

**Table 3: Work environment satisfaction degree among nurses (n = 232)**

Items	Dissatisfied n (%)	Moderate/ not too bad n (%)	Satisfied n (%)	Mean±SD
1. Satisfaction with the adequacy of support services (clerks, patient transport, personnel etc.) provided for quality care of the patients	33 (14.2)	134 (57.8)	65 (28.0)	2.14±0.637
2. Satisfaction with the adequacy of time and opportunity to discuss patient care problems with more experienced nurses or those working in other disciplines	28 (12.1)	125 (53.9)	79 (34.1)	2.22±0.644

3.Satisfaction with the adequacy of medical supplies, drugs and up-to-date equipment to provide quality patient care	12 (5.2)	153 (65.9)	67 (28.9)	2.24±0.534
4.Satisfaction with the regularity of suggestions and support from colleagues/ seniors working in urban areas for extending better health services through personal/team visits or through tele-health (distance-based technology) to improve your knowledge and skills	39 (16.8)	125 (53.9)	68 (29.3)	2.13±0.669
5.Satisfaction with the accessibility to any professional network, rural health professional associations that consists of nurses working in rural areas	95 (40.9)	108 (46.6)	29 (12.5)	1.72±0.675
6.Satisfaction with any award or recognition you have received while working in rural areas based on performance or any other relevant indicators	141 (60.8)	78 (33.6)	13 (5.6)	1.45±0.60

**Correlation between the living conditions, work environment and intention to stay among nurses in their current posts of work**

The correlation between the intention to stay in current posts, living condition and work environment inventories were assessed using the Spearman correlation coefficient. The study findings showed a positive and significant correlation between nurses’ living condition and intention to stay in rural areas ( $r = 0.21, p < 0.01$ ). This indicates that nurses who were satisfied with living conditions intended to stay longer in rural areas than nurses who were less satisfied. Also, the correlation between intention to stay in

current posts and work environment was positive and significant ( $r = 0.25, p < 0.01$ ). This states that nurses who expressed satisfaction in work environment at their current place of postings reported higher intention to stay than nurses who expressed their work environment as unsatisfactory. Furthermore, the results of the study stated a positive correlation between living condition and work environment ( $r = 0.34, p < 0.01$ ). The data of spearman correlation coefficient results was given in Table 4.

**Table 4: Spearman correlation for living condition, work environment and intention to stay (n =232).**

	Living condition	Work environment	Intention to stay in current posts
Living condition	1	.34**	.21**
Work environment	.34**	1	.25**
Intention to stay in current posts	.21**	.25**	1

\*\* $p < .01$

Table 5 represented the results of binary logistic regression. It was carried out to examine the factors that are significantly associated with intention to stay in rural areas. “Intention to stay” was the dependent variable measured categorically and replied with “yes” or “No”. The independent variables were general characteristics of nurses, living conditions and work environment inventories. The investigation of the nurse results indicated that lower age, good living conditions and satisfactory work environment were significantly associated with intent to stay in rural areas. Other background variables did not significantly associate with intent to stay. Age was significant predictor (OR= 0.95, 95% CI = 0.89 – 0.98;  $P = 0.047$ ), the odds of nurses reporting an intention for rural retention decreases by 0.05 times with every one year increase in their age. Living conditions were significantly associated with intention to stay (OR =1.13, 95% CI = 1.04 - 1.22,  $P = 0.009$ ). This means that nurses who reported to be satisfied with their living conditions were more likely to stay in rural areas. Furthermore, work environment was also significantly related to intention to stay in rural areas (OR = 1.07, 95% CI = 1.01 – 1.14,  $P = 0.015$ ), the odds of intention for rural retention is 1.07 times higher among nurses who perceive their work environment as supportive as their unsatisfied counterparts.

**Table 5. Binary logistic regression predicting factors affecting intent to stay among nurses working in rural areas, Odisha, 2017.**

Variables	OR	95% CI	P-value
Age	0.95	0.89 - 0.98	0.047
Gender			
Male	1		
Female	1.33	0.33 - 5.29	0.677
Marital status			
Single	1		
Married	1.60	0.68 - 3.73	0.275
Religion			
Hindu	1		
Others	0.64	0.29 - 1.40	0.271
Work experience in rural areas (years)			
< 1 year	1		
1 - 5 year	1.90	0.63 - 5.70	0.248
6-10 year	5.04	0.70 - 23.70	0.060
11-15 year	1.85	0.40 - 8.48	0.426
>15 year	5.55	0.86 - 35.74	0.071
Time travel (one way) to workplace			
More than 1 hr	1		
30-60 minutes	2.44	0.45 - 5.78	0.298
< 30 minutes	1.89	0.72 - 4.97	0.280
Living condition	1.13	1.04 - 1.22	0.009
Work environment	1.07	1.01 - 1.14	0.015

OR = Odds ratio, CI = Confidence Interval, Values (p<0.05) stands statistically significant.

### **Discussion**

Improving the living conditions, work environment at work for nurses and their retention in rural areas is a multifaceted policy challenge. The health-systems issues for retaining health workers in underserved and rural areas has been studied extensively throughout the world<sup>14, 21-24</sup>. The present study findings bring a range of known factors and some of new ones that are critical for improved rural retention of nurses.

The study suggests that nurses were at border line of moderately satisfied with their living conditions inventories. It can be said that life in rural areas is negative and often consider as substandard with several issues such as provision of basic amenities, schooling, housing, roads and transportation facilities, and safety as concerned were among the biggest issues across health workers. In present study, nurses were moderately satisfied with basic

amenities at current work, schooling for their children and housing facilities. These factors are corroborate with previous findings of study<sup>23, 25, 26</sup>. However, nurses were least satisfied with the prospects of employment for their spouse which is also inconsistent with previous research studies<sup>23,26</sup>. In work environment inventories, nurses were expressed satisfactory in most of the items which is in line with studies conducted by Ethiopia<sup>27</sup>, Italy<sup>28</sup>, and the USA<sup>29</sup>. This might also be due to Indian government's active initiative and massive spent on rural health facilities to improve patient care under NHM. However, nurses were least satisfied with any award or recognition received while working in rural areas. It is understood that praise, awards and recognition can motivate nurses and make them happy at work<sup>30, 31</sup>, but in this study nurses stated dissatisfaction with awards and recognition. Therefore, policymakers and nurse administrators should consider any reward and recognition for those nurses who work relentlessly in rural areas. In spite of mixed opinion, the nurses in this study have shown a high level of intention at work in rural areas (73.7%). This might be due to the improvement of rural infrastructure in past one decade and state government have invested in health infrastructure and adapted various policies to attract and motivate rural health workers under NHM. In addition, nurses working in rural areas might belong to their home location; thus wanted to settled down or coming from the nearest regions and wanted to stay and work in rural areas. Nevertheless, more studies are needed to examine other factors that influence retention rate in underserved and rural areas.

The results of the Spearman Correlation among investigated nurses have illustrated that a positive correlation between living conditions and work environment inventories. Such findings are corroborated with past studies conducted in various parts of the world stated that living conditions and work environment is positively correlated to overall job satisfaction<sup>32, 33</sup>. Therefore, it is crucial for nurse administrators and implementers to develop positive and supportive work environment by considering issues of living and work conditions of nurses at work which might give overall job satisfaction.

The logistic regression revealed that age, living conditions and work environment were predictor variables with intent to stay in rural areas. Age was significantly associated with intent to stay at work in rural locations which means that nurse

intention towards rural service gradually decreases in every one year rise in age. This illustrates that the younger nurses are more prefer to work in rural areas for some years. This also highlights the importance of designing targeted retention strategies especially for young nurses and fresh graduates in rural and underserved areas<sup>34</sup>. The policy makers and administrators must implement strategies in an engaging way involving fresh graduates and younger nurses, so they can motivate acceptance offers in rural areas<sup>35</sup>. Additionally, findings from this study showed that living conditions and work environment were significant predictors for nurses towards intention to stay in rural areas. This indicate that nurses who perceived their work environment and living conditions are supportive intended to work and stay more in remote and rural areas than other nurses. Related findings from other literatures suggest that supportive work environment and living conditions can increase rural retention at work among nurses<sup>36-39</sup>.

#### **Limitations of the study**

The study has following limitations. First, the study employed cross-sectional survey design, hence it is difficult to establish cause and affect relationships. Second, only 6 districts were undertaken for study out of total 30 districts of Odisha, so our findings may not be generalized. Finally, self-administered structured questionnaire were used for data collection which may lead to response bias from each participants. Despite such shortcomings, the findings of the study alludes a number of important aspects such as enhancing the living conditions and work environment issues to where interventions are needed to address improved rural retention among nurses in rural and underserved areas.

#### **Conclusions**

The findings of the present study illustrated that the nurses of Odisha were moderately satisfied with the items of living condition domain; however they were satisfied with the items of work environment at their work place. About 73.7% of nurses considered to stay and work in rural areas for next 36 months. This prompts the policy makers and administrators

to design bundle of interventions that supports nurses to work in underserved areas. Further, age, living conditions and the work environment were significantly associated to the intent to stay in rural areas.

Based on this findings, nurse administrators and policy planners should improve the living conditions and to establish a supportive work environment in rural areas. A tailor made intervention are needed that can boost young nurses motivation and attract them to opt for rural service. Moreover, accommodation with other infrastructure and amenities facility (Such as water, telephone, electricity etc) to work in rural areas should be provided. This findings also may be interested to policy and decision makers, so that they can devise feasible solutions to overcome nurse shortage in rural areas. This study highlighted the relationship between living conditions, work environment and intention to stay among nurses who dedicate themselves in rural areas for human service.

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#### **Conflict of Interest**

The author declares there is no conflict of interest.

#### **Authors contribution:**

Conceptualization and idea owner of this study: MRB

Study design: MRB, DB, CP

Project administration: MRB, DB

Data gathering: MRB and DB

Writing and submitting manuscript: MRB, DB

Editing and approval of final draft: MB, DB, CP



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