Caregiver Recruitment and Retention at Nurse Care of North Carolina

Shruti Raj

MPS (Biomedical and Health Informatics) Candidate
University of North Carolina at Chapel Hill
Introduction

- Caregivers are the centerpiece of the long-term care industry.
- Consists of registered nurses (RNs), licensed practical nurses (LPNs), certified nursing assistants (CNA 1, CNA 2, CNA 1+4) and personal care assistants (PCAs).
- They provide hands-on care to a large number of elderly and younger people with chronic illness and disabilities. The care is intimate, personal, and both physically and emotionally challenging [Stone, R. 2001].
- Among the lowest wage earners in the United States [Stone, R. 2001].
- Long-term care industry is facing a serious problem of shortage of caregivers.
- This shortage is multidimensional and can be attributed to negative growth in wages and benefits, dissatisfactory work conditions and large percentage of nurses reaching retirement.
- In recent times, home care and facility staffing companies face significant challenges in caregiver retention and recruitment.
Shortage of direct care workers - A National Issue


CNA Turnover and National Unemployment, 2007 to 2012


Workforce Supply and Demand, 2012 to 2022


About the company

- Premium health care services company, providing in-home care and medical staffing needs to the Central and Eastern North Carolina communities.

- It provides hands-on, companion and/or nursing care to patients seeking care individually at home or healthcare facilities.
Most significant challenges for Nurse Care of North Carolina (NCNC):  

1. Recruitment of high quality caregivers  
2. Retention of these caregivers over a meaningful length of time (at least one year)  

Problem addressed through this project:  

How can NCNC improve its recruitment and retention strategies so that it can provide better, more reliable, and more consistent quality care to its clients over time?  

Approach:  

- Analysis of company’s existing recruitment strategy  
- Analysis of the successful and unsuccessful hires in the last few years  
- Understanding the level of job satisfaction amongst the current caregivers through surveys  
- Understanding the work experience of former caregivers with NCNC through surveys  
- Understanding the current hiring environment via in-person interviews, surveys, etc.
Steps in data analysis:

Data Collection
• Interview with the office staff and prospective caregivers
• Surveys
• Data from employee management system (eRSP)

Data Cleaning and Transformation
• Remove caregiver data before 2012
• Remove caregiver data where age was less than 18 years
• Remove caregiver data where employment duration was less than a week
• Various attributes like length of employment, caregiver retention percentage, staying probability, etc. were calculated.

Data Analysis and Interpretation
• R programming
• MS-Excel
• Google Analytics
• Providing recommendations to NCNC based on the data analysis
Data Analysis and Interpretation
Trends in No Call No Show Candidates for 2017
Trends in hired and no call no show candidates for 2017 - Durham

Percentage (%)

Month

NCNS Percentage

Hired Percentage
Trends in hired and no call no show candidates for 2017 - Raleigh

- **Hired Percentage**
- **NCNS Percentage**

Month:
- January
- February
- March
- April
- May
- June
- July
- August
- September
- October
- November
- December
Identifying Reasons
Inactive Caregivers Regression Analysis
Durham

```r
# Clean the imported caregiver data
# Remove caregivers hired before 2012
# Remove caregivers with age less than 18
# Remove caregivers with duration of employment less than a week
Durham.ic <- Durham[Durham.ic$Age on termination day (in years) > 17,]
Durham.ic <- Durham[Durham.ic$Duration of Employment (in days) > 7,]

# Converting data class of column 'Hiring Year' from integer to character
D.ic$s Hiring Year <- as.character(D.ic$s Hiring Year)

# Separate regression analysis for class, gender, age and hiring year
durham.reg1 <- lm(D.ic$s Duration of Employment (in days) ~ D.ic$s Class,
summary(durham.reg1)

durham.reg2 <- lm(D.ic$s Duration of Employment (in days) ~ D.ic$s Gender,
summary(durham.reg2)

durham.reg3 <- lm(D.ic$s Duration of Employment (in days) ~ age on termination day (in years),
summary(durham.reg3)

durham.reg4 <- lm(D.ic$s Duration of Employment (in days) ~ D.ic$s Hiring Year,
summary(durham.reg4)

Call:
lm(formula = D.ic$s "Duration of Employment (in days) ~ D.ic$s Class"

Residuals:
Min       1Q     Median       3Q      Max
-385.76   -168.74   -88.87   94.76  1668.24

Coefficients:
Estimate Std. Error t value Pr(>|t|)
(Intercept) 257.743    11.019   23.382  < 2e-16 ***
D.ic$sClassCA1 147.022    44.065    3.386 0.000891 ***
D.ic$sClassCA2 13.014    11.301    1.158 0.249711
D.ic$sClassCA3 -59.931    29.493   -2.042 0.043964 *
D.ic$sClassCA4 -4.698    14.614   -0.324 0.746623
D.ic$sClassCA5 108.057   111.448    0.970 0.332574
D.ic$sClassCA6  4.124    18.731   0.221 0.825235

Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
```
Raleigh

# Clean the imported caregiver data
# Remove caregivers hired before 2012
# Remove caregivers with age less than 18
# Remove caregivers with duration of employment less than a week

library(RCaregiver) # Assuming a specific library is used for caregiver data
library(dplyr)

library(RCaregiver)
library(dplyr)

# ic-Inactive_Caregivers_Raleigh[Inactive_Caregivers_Raleigh$'Hiring_Year'>'2011,]
rfc=R[ic$'Hiring_Year'>'2011]
rfc=R[ic$'Age on termination day ( in years)'>17]
rfc=R[ic$'Duration of Employment (in days)'>'7.7]

# Convert data class of column 'Hiring Year' from integer to character
rfc$'Hiring Year' = as.character(rfc$'Hiring Year')

# Separate regression analysis for class, gender, age and hire date
rfc.reg1=lm(rfc$'Duration of Employment (in days)'~rfc$'Class',)
summary(rfc.reg1)

rfc.reg2=lm(rfc$'Duration of Employment (in days)'~rfc$'Gender',)
summary(rfc.reg2)

rfc.reg3=lm(rfc$'Duration of Employment (in days)'~rfc$'Age on termination day ( in years)'~rfc$'Hiring Year',)
summary(rfc.reg3)

Call:
lm(formula = Raleigh.ic$'Duration of Employment (in days)' ~ Raleigh.ic$'Class')

Residuals:
     Min      1Q  Median      3Q     Max
-193.50  -172.01  -67.01  97.00  1674.26

Coefficients: Estimate Std. Error t value Pr(>|t|)
(Intercept)     268.0133     11.8325  22.651  < 2e-16 ***
Raleigh.ic$'ClassCNA14'  136.7514     44.7374   3.057   0.00232 **
Raleigh.ic$'ClassCNA21'  27.7220     44.7374   0.618   0.53608
Raleigh.ic$'ClassSEC'   -63.0662     28.9038  -2.181   0.02948 *
Raleigh.ic$'ClassSPN'   -12.2347     29.4517  -0.416   0.67746
Raleigh.ic$'ClassSRO'   142.4567    526.3951   0.265   0.79396
Raleigh.ic$'ClassSRN'    0.7774     40.1461   0.019   0.98456

---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

# Additional code for data analysis and visualization in RStudio console
Greensboro

# Remove caregivers hired in 2014, 2015 and 2018
# Remove caregivers with age less than 38
# Remove caregivers with duration of employment less than a week
G_ic_Inactive_Caregivers_Greensboro[Inactive_Caregivers_Greensboro"Hiring Year">2013,]
gboro.ic_gboro.ic[Gboro.ic"Age on termination day (in years)">77,]
gboro.ic_gboro.ic[Gboro.ic"Duration of Employment (in days)">77,]
View(Greensboro.ic)

# Converting data class of column 'hiring year' from integer to character
Greensboro.ic"Hiring Year" <- as.character(Greensboro.ic"Hiring Year")

# Separate regression analysis for class, gender, age and hiring year
gboro.reg1 lm(Greensboro.ic"Duration of Employment (in days)"~Greensboro.ic"Class",)
summary(gboro.reg1)

summary(gboro.reg2 lm(Greensboro.ic"Duration of Employment (in days)"~Greensboro.ic"Gender",)

summary(gboro.reg3 lm(Greensboro.ic"Duration of Employment (in days)"~Greensboro.ic"Age on termination day (in years)",)

summary(gboro.reg4 lm(Greensboro.ic"Duration of Employment (in days)"~Greensboro.ic"Hiring Year",

lm(formula = Greensboro.ic"Duration of Employment (in days)" ~ Greensboro.ic"Class")

Residuals:
Min 1Q Median 3Q Max
-181.05 -114.76 -44.51 89.50 118.99

Coefficients:
                     Estimate Std. Error t value Pr(>|t|)
(Intercept)           197.013    13.021  15.116  < 2e-16 ***
Greensboro.icClassCNA14  262.653     76.590   3.429  0.000877 ***
Greensboro.icClassCNA2   -55.389     55.389  -1.000   0.319144
Greensboro.icClassCNA3   -7.013     76.590  -0.092   0.927221
Greensboro.icClassCN1PN  47.987     41.999   1.143  0.259188
Greensboro.icClassCNA1PC  31.033     93.200   0.333   0.740064
Greensboro.icClassCNA1RN   7.487     48.381  0.155  0.873313

---
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Environment History
Global Environment
- crd.reg3 List of 12
durham.reg1 List of 13
durham.reg2 List of 13
durham.reg3 List of 13
durham.reg4 List of 13
F90.reg1 List of 13
F90.reg2 List of 13
Firstfew_2011.List of 13
Firstfew_2011.List of 13
gboro.reg1 List of 13
R

Projects (6)
- Data/Regression/Companion/Companion.R
- Data/Regression/Companion/DHIC.Notebook.R
- Data/Regression/Companion/My Data Sources
- Data/Regression/Companion/Custom Office Templates
- Data/Regression/Companion/DHIC_Caregivers.R
- Data/Regression/Companion/R
- Data/Regression/Companion/Python
- Data/Regression/Companion/Python
- Data/Regression/Companion/RData
- Data/Regression/Companion/RData

View (1)
- R Script
Survey Analysis
Former Caregivers Survey
The Participants:

Total number=39

Certifications:
35 responses

- PCA: 20%
- CNA 1: 14.3%
- CNA 1+4: 8.6%
- CNA 2: 57.1%

Years of Experience as a Caregiver:
39 responses

- 0-1 years: 38.5%
- 2-4 years: 12.8%
- 5-7 years: 10.3%
- 8-10 years: 30.8%
- More than 10 years
Question 7: What did you like most about your job at Nurse Care?

38 responses

- Relationships with clients: 34.2%
- Relationships with other caregivers: 7.9%
- Company culture: 36.8%
- Bonus opportunities: ...
- Relationships with office staff: ...
- Schedule Flexibility: ...
- Working for Ari, he's an awesome pe...: ...
- None: ...
Question 10: Did you participate in any of the following Nurse Care benefit programs? If yes, select the appropriate options. (Select all that apply)

25 responses

- Stars & Strikes Bonus Program: 13 (52%)
- Buddy System Referral Bonus: 4 (16%)
- Medical/Dental/Vision Insurance: 2 (8%)
- 401(k) Retirement Plan: 1 (4%)
- Classes / Training Opportunities: 15 (60%)
- No: 1 (4%)
-was not eligible for any benefits: 1 (4%)
-None: 1 (4%)
Significant Observations:

- All the caregivers that reported their overall experience with Nurse Care as bad or very bad mentioned their communication with the office staff as difficult or very difficult.

- Vast majority of the caregivers that reported their overall experience with Nurse Care as bad or very bad were not satisfied with the payscale and still work as caregiver.

- Most of the former caregivers that reported their overall experience with Nurse Care as great mentioned their ease of communication with the office staff as easy or very easy.

- 73% of the caregivers said that they were given appropriate training/tools to succeed at their job.

- Top two areas for improvement according to former caregivers- Pay scale and Communication with the office staff.
Current Caregiver Survey
The Participants:

Total number=98
Question 3: How satisfied are you with the pay scale?

97 responses
Question 7: What do you like most about your job at Nurse Care?

99 responses

- 46.5% Relationships with clients
- 38.4% Company Culture
- 2.1% Bonus Opportunities
- 1.0% Relationships with office staff
- 1.0% Schedule Flexibility
- 0.5% All of the above
- 0.3% All of the above
Question 9: Have you ever participated in any of the following Nurse Care benefit programs? If yes, select the appropriate options (select all that apply).  
78 responses

- Stars & Strikes Bonus Program: 54 (69.2%)
- Buddy System Referral Bonus: 14 (17.9%)
- Medical/Dental/Vision Insurance: 8 (10.3%)
- 401(k) Retirement Plan: 6 (7.7%)
- Classes/Training Opportunities: 38 (48.7%)
- No: 2 (2.6%)
- NA: 1 (1.3%)
- N/A: 1 (1.3%)
- None: 1 (1.3%)
- no: 1 (1.3%)
- BLS CPR Training: 1 (1.3%)
Question 12: How has your overall experience with Nurse Care been to date?

99 responses

- Great: 45.5%
- Good: 41.4%
- Neither good nor bad: 12.1%
- Bad: 0%
- Very bad: 0%
Significant Observations:

- CNA1s came up as the most dissatisfied class of caregivers as far as pay scale satisfaction is concerned (~20%).

- Most of the caregivers that had negative/neither good nor bad experience with the company were not satisfied with the payscale.

- 74.5% of the caregivers were satisfied with the number of hours they currently work but 24.5% of the caregivers would like to work more hours.

- Majority of the caregivers said that they have given appropriate tools/training to succeed at their job.

- 63.6% caregivers have never attended the employee appreciation events.

- On being asked how long do you see yourself working with Nurse Care, 47.9% answered more than 5 years and 39.4% answered 1-3 years.
Ranking of rewards that caregivers would like to get:

1. Hourly pay increase
2. Bonus
3. Individual recognition at the company

Ranking of areas for improvement according to the caregivers:

1. Better pay
2. Better bonus opportunities
3. More employee recognition
4. Easy communication with office staff/administrator
5. Better flexibility in schedule
Prospective Caregiver Survey
Significant Observations:

- Top three things that the prospective caregivers are looking for in a job-
  1. Good Pay
  2. Schedule Flexibility
  3. Recognition

- Prospective caregivers’ preference for being rewarded-
  1. Bonuses
  2. Both bonuses and individual recognition at the company
  3. Individual Recognition

- 73.91% of the interviewee’s heard about the company from current employees (39.13%) or Indeed (34.78%).

- Things that interviewee’s appreciated about the interview process were that the interview process was quick and interviewer was professional, friendly and clear.

- Interviewee’s appreciated the fact the company is flexible on schedule.
Caregiver Scheduling System - Technological Aspects

Strengths
1. Possesses 'not available' feature
2. Schedule viewing
3. Available shift broadcasting

Limitations
1. Lacks 'availability feature'
2. Communication via phone calls more effective than online scheduling
Data Analysis Limitations:
1. Inaccurate/dishonest survey response
2. Outliers in the dataset
3. Data inconsistency

Data Analysis Strengths:
1. Data obtained from single source; therefore, no data integration problem.
2. Identification of important trends
3. Better decisions
Recommendations

1. Evaluate caregivers performance every 6 months and conduct focus group sessions with the caregivers with satisfactory or above satisfactory performance to get their feedback and address their concerns.

2. Target and schedule at least twice as much interviews as usually done for the months of March, May, July and August. Active follow-up with the candidates might also be helpful for these months.

3. Plan on giving more of career development and promotion opportunities like CNA 1+4 classes to the caregivers to retain them for longer period.
4. Work towards improving communication between the caregivers and the office staff.

5. Increase participation of the caregivers in “Buddy System Referral Bonus”.

6. 24.5% of the current caregivers expressed to work more hours; therefore, work to see if it is possible at all.

7. Increasing the scope of helping others by providing stable assignments to encourage relationships with clients and involving caregivers while developing care plans for the clients they have been assigned.
References:


- In-home Care and Nursing Care | Medical Staffing Services. Retrieved from https://www.nursecarenc.com/services/


