



Caregiver Recruitment and Retention at Nurse Care of North Carolina

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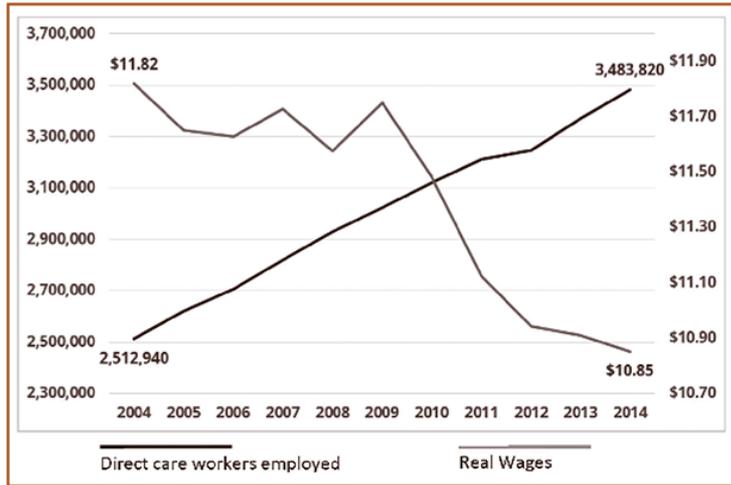
University of North Carolina at Chapel Hill



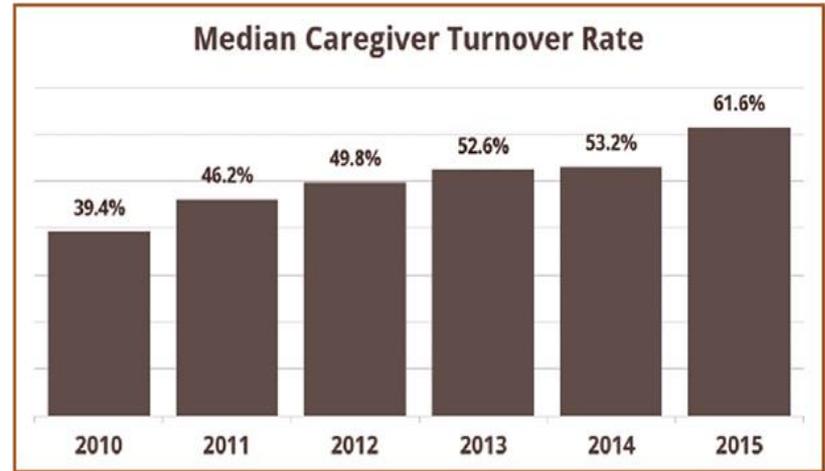
Introduction

- 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

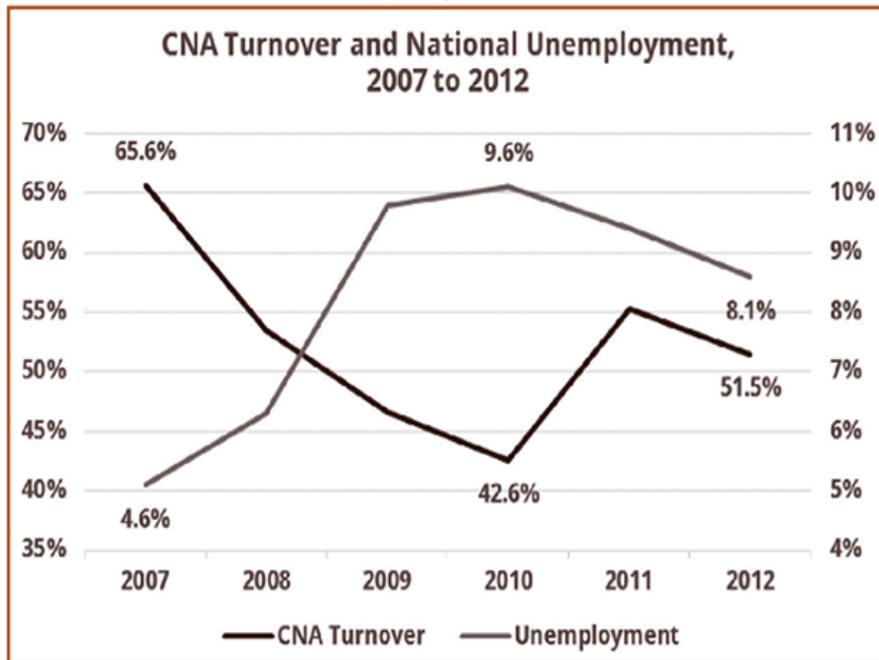


Source: All wages are adjusted for inflation based on 2014 dollars. Bureau of Labor Statistics, 2014 Occupational Employment Statistics (OES) Program Data.

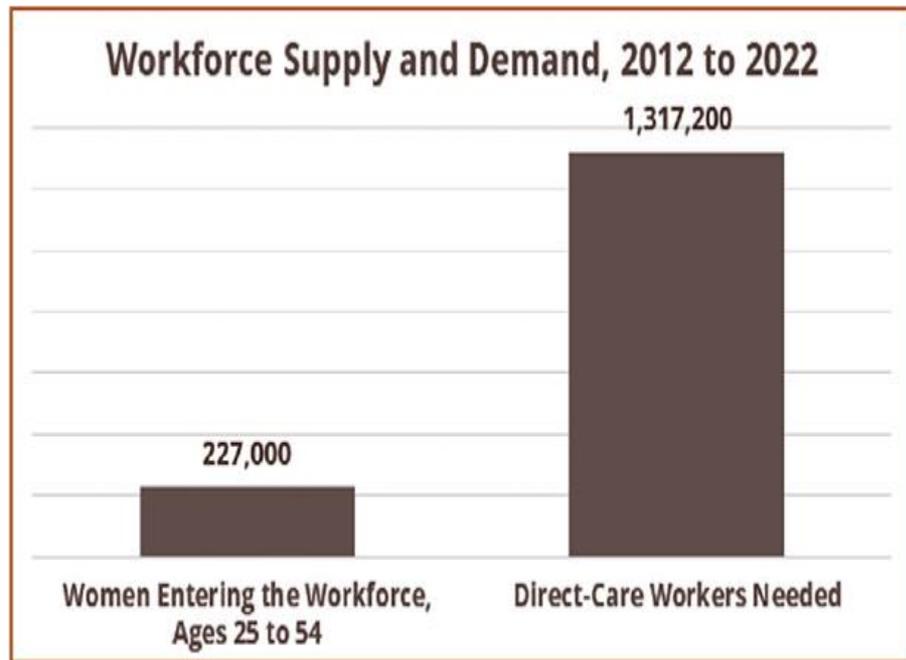


Source: 6th Annual Edition of the Private Duty Benchmarking Study, Home Care Pulse, 2015.

Source: <http://www.asaging.org/blog/direct-care-workforce-raising-floor-job-quality>



Source: American Health Care Association, 2012 Quality Report; U.S. Bureau of Labor Statistics, National Unemployment Rate.



Source: U.S. Bureau of Labor Statistics, 2012-2014 Employment Projections Program Data.

Source: <http://www.asaging.org/blog/direct-care-workforce-raising-floor-job-quality>

About the company



NURSE CARE

• NORTH CAROLINA •

- 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.

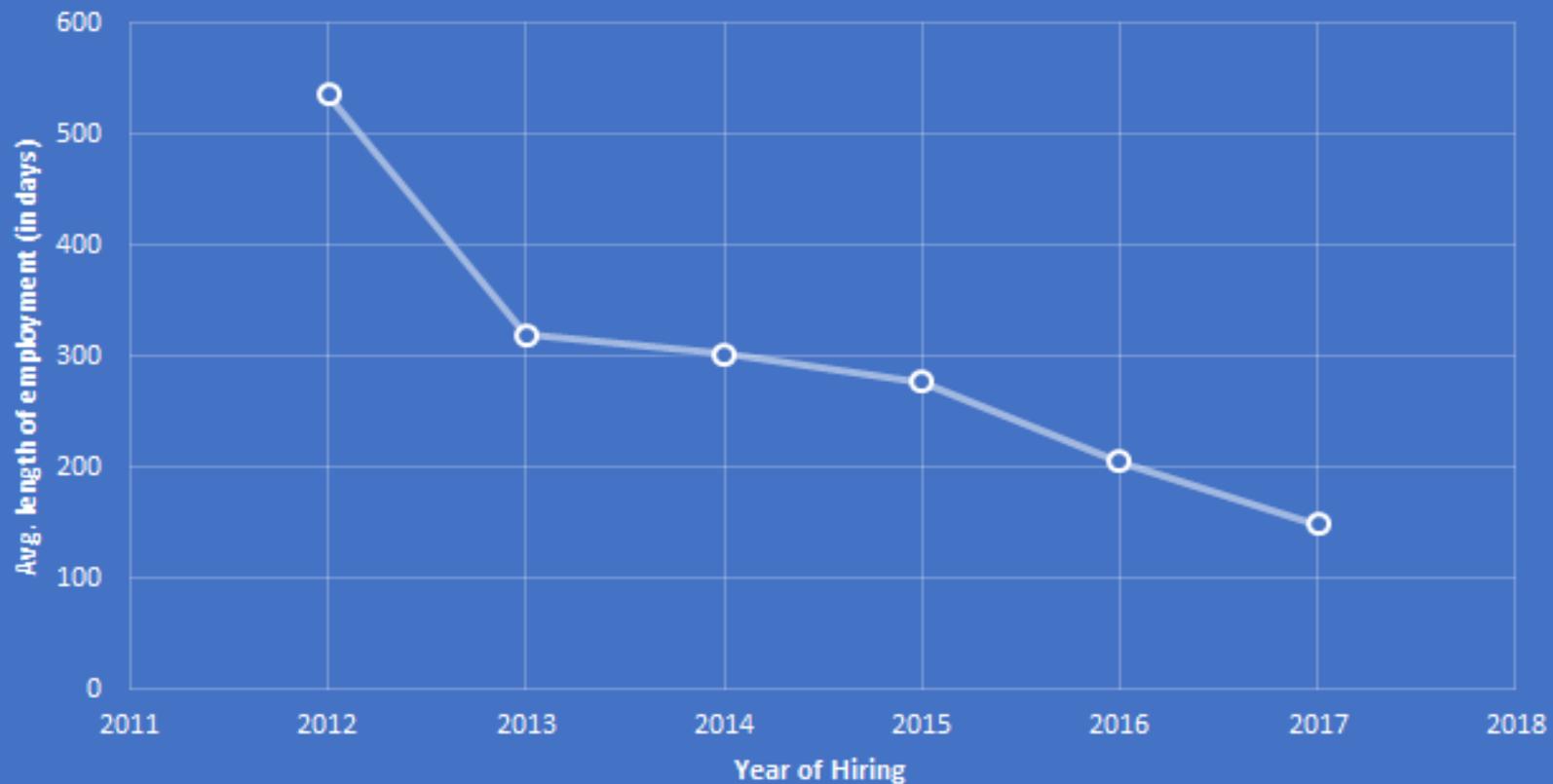
Data Analysis and Interpretation

- R programming
- MS- Excel
- Google Analytics
- Providing recommendations to NCNC based on the data analysis

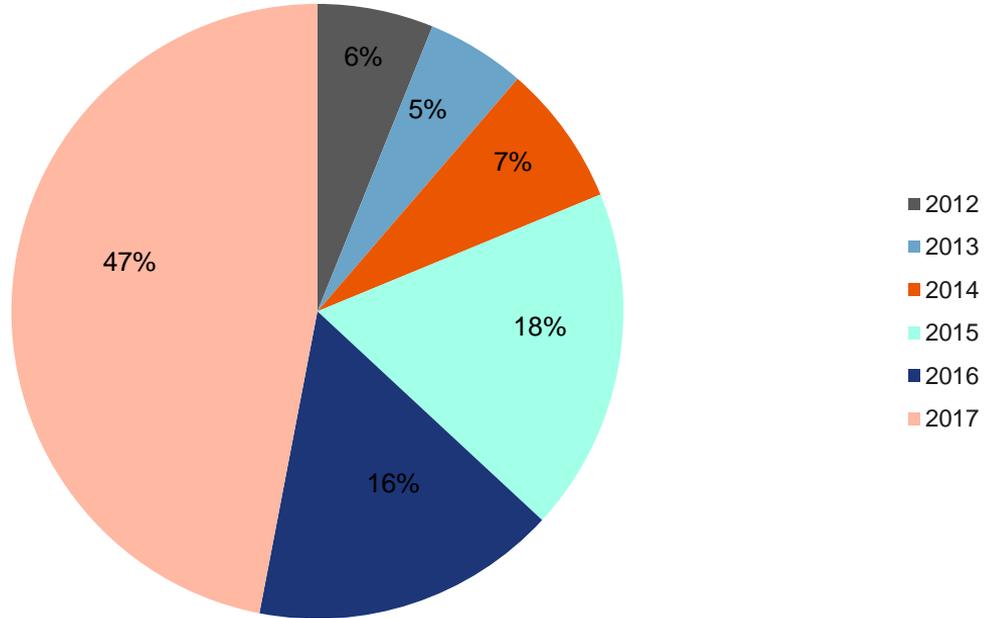


Data Analysis and Interpretation

TREND IN LENGTH OF EMPLOYMENT

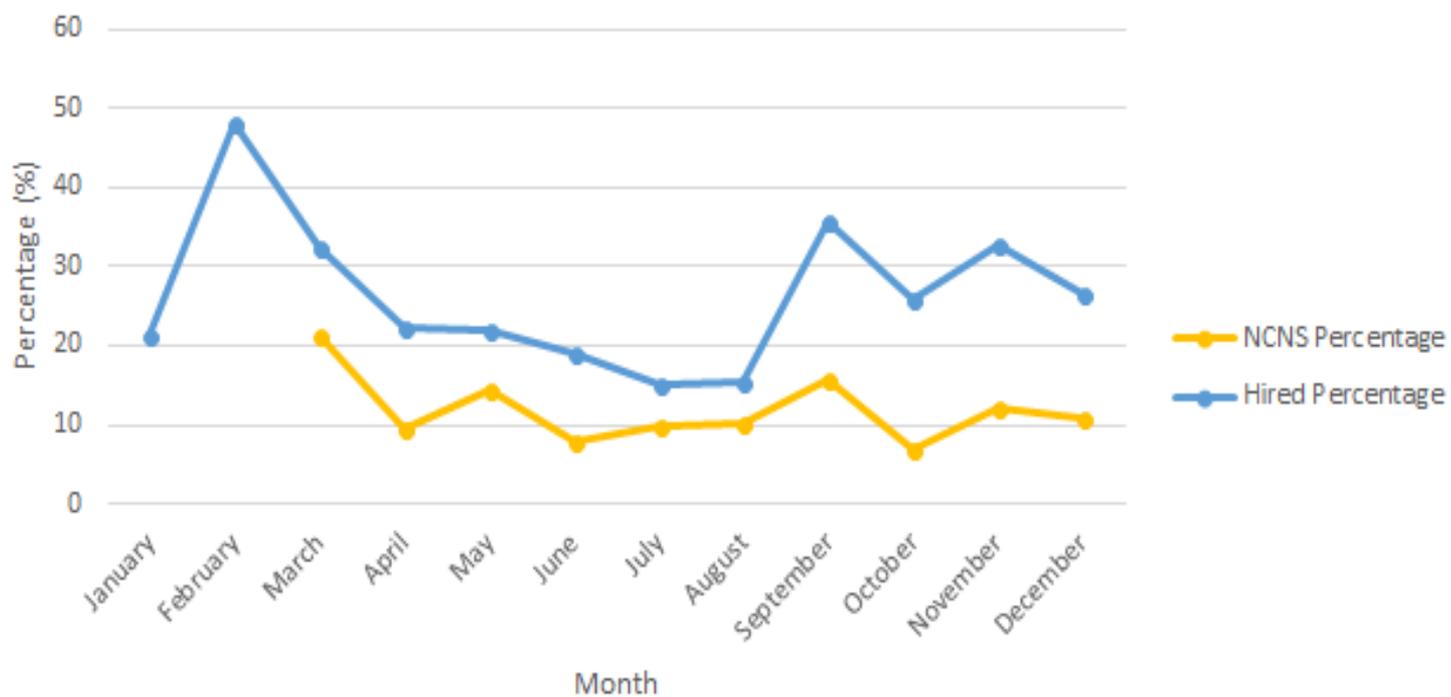


Caregiver Retention Percentage (%)

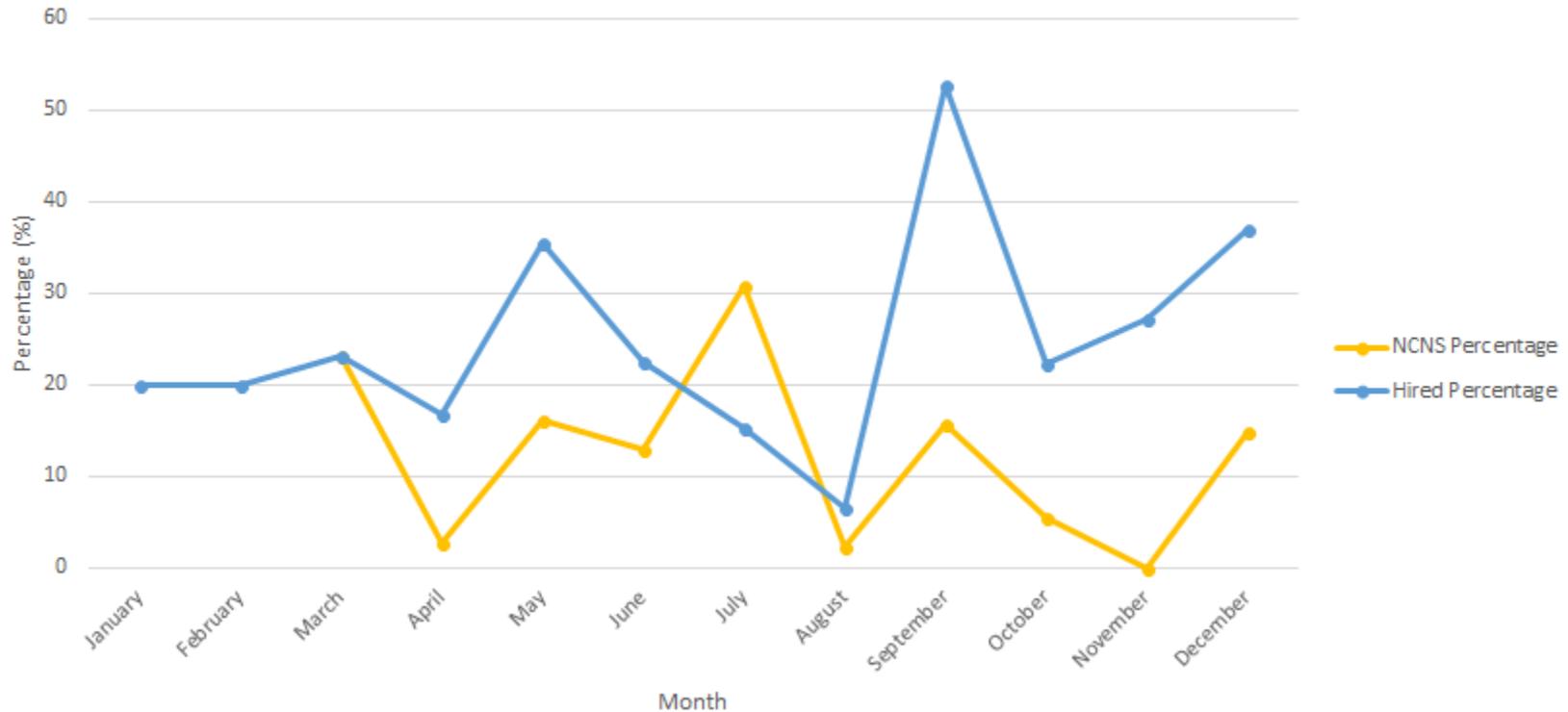


Trends in No Call No Show Candidates for 2017

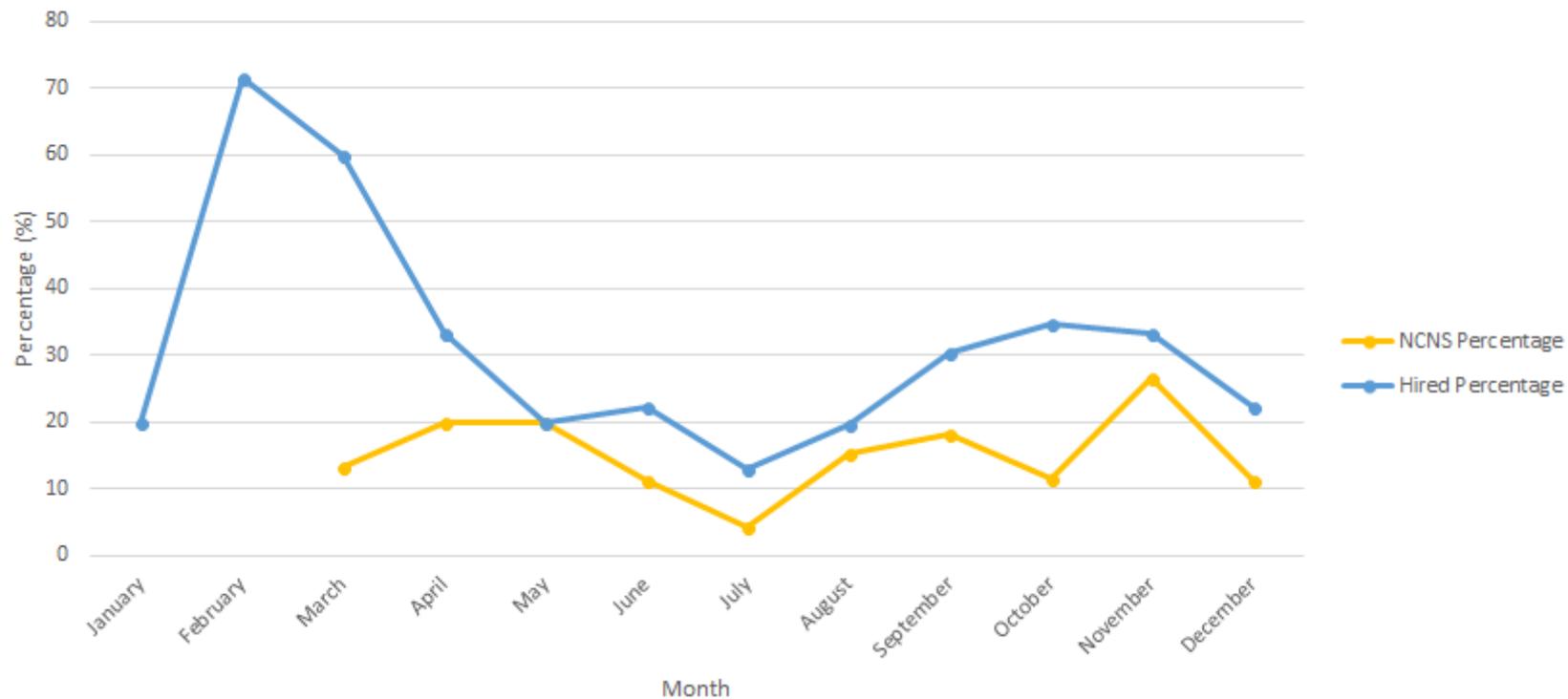
Trends in hired and no call no show candidates for 2017



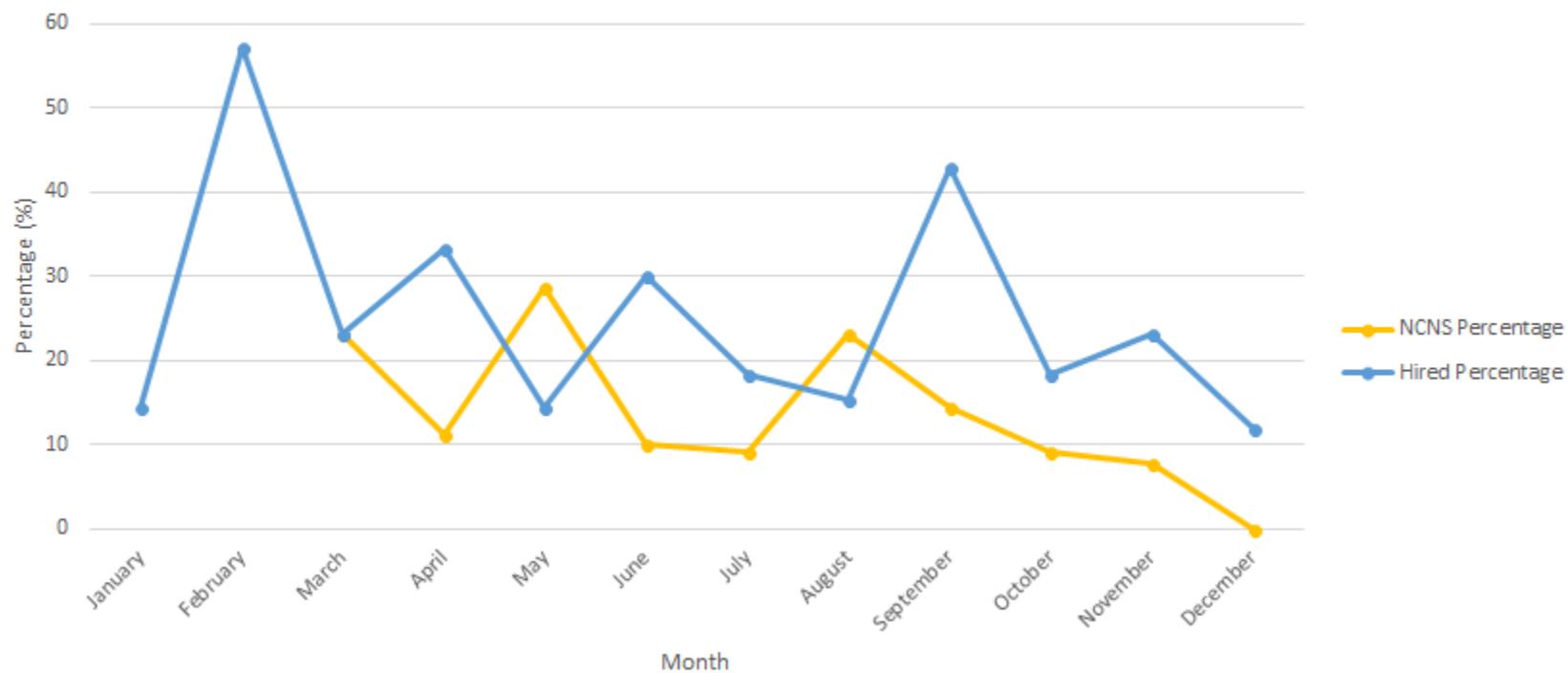
Trends in hired and no call no show candidates for 2017- Durham



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



Trends in hired and no call no show candidates for 2017- Greensboro





Identifying Reasons

Inactive Caregivers Regression Analysis

Durham

RStudio

File Edit Code View Plots Session Build Debug Profile Tools Help

Go to file/function Addins

```
Raleigh_ic.R x first90.R x Durham_ic.R x D_ic x NCNC_CaregiverData_clean.R x Untitled1* x NCNS_new.R x first90 x Inactive_Caregivers_Greensboro x Greensboro_ic.R x
Source on Save Run Source
1 # Clean the imported caregiver data
2 # Remove caregivers hired before 2012
3 # Remove caregivers with age less than 18
4 # Remove caregivers with duration of employment less than a week
5
6 Durham_ic=Inactive_Caregivers_Durham[Inactive_Caregivers_Durham$'Hiring Year'>2011,]
7 Durham_IC=Durham_ic[Durham_ic$'Age on termination day ( in years) '>17,]
8 D_ic=Durham_IC[Durham_IC$'Duration of Employment (in days) '>7,]
9 View(D_ic)
10
11 # Converting data class of column 'Hiring Year' from integer to character
12
13 D_ic$'Hiring Year' = as.character(D_ic$'Hiring Year')
14
15 # Separate regression analysis for class, gender, age and hiring year
16
17 durham.reg1=lm(D_ic$'Duration of Employment (in days) '~D_ic$'Class', )
18 summary(durham.reg1)
19
20 durham.reg2=lm(D_ic$'Duration of Employment (in days) '~D_ic$'Gender', )
21 summary(durham.reg2)
22
23 durham.reg3=lm(D_ic$'Duration of Employment (in days) '~D_ic$'Age on termination day ( in years)', )
24 summary(durham.reg3)
25
26 durham.reg4=lm(D_ic$'Duration of Employment (in days) '~D_ic$'Hiring Year', )
27 summary(durham.reg4)
28
29:1 (Top Level) ↓ R Script ↓
```

```
Console ~/ ↵
Call:
lm(formula = D_ic$"Duration of Employment (in days)" ~ D_ic$Class)

Residuals:
    Min       1Q   Median       3Q      Max
-385.76 -168.74  -68.87   94.76 1668.24

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  257.743    11.619   22.182 < 2e-16 ***
D_ic$ClassCNA14 147.022     44.065    3.336 0.000891 ***
D_ic$ClassCNA2   13.014     42.370    0.307 0.758817
D_ic$ClassGEC  -59.505     29.433   -2.022 0.043564 *
D_ic$ClassLPN   -4.698     28.726   -0.164 0.870138
D_ic$ClassPCA  108.057    111.448    0.970 0.332574
D_ic$ClassRN     4.124     38.731    0.106 0.915235

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

Environment History

Global Environment

Raleigh_ic 745 obs. of 17 variables

Values

- ash.reg1 List of 13
- ash.reg2 List of 13
- ash.reg3 List of 12
- ash.reg4 List of 13
- ash.reg5 List of 13
- crd.reg1 List of 13
- crd.reg2 List of 13
- crd.reg3 List of 12
- crd.reg4 List of 13
- durham.reg1 List of 13

Files Plots Packages Help Viewer

New Folder Delete Rename More

Name	Size	Modified
UnivComparison.xlsx	12.1 KB	Jul 29, 2018, 6:14 PM
Shruti's Notebook.url	121 B	Jan 29, 2018, 1:26 PM
R		
Python Scripts		
My Tableau Repository		
My Data Sources		
Custom Office Templates		
ASH_caregivers.R	1.4 KB	Jul 16, 2018, 11:43 AM
abc.url	121 B	Jan 29, 2018, 1:03 PM
.Rhistory	14.5 KB	Sep 14, 2018, 1:14 PM
.RData	722 KB	Aug 9, 2018, 9:13 AM

Raleigh

RStudio

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Go to file/function Addins

Raleigh_ic.R x Raleigh_ic.R x first90.R x Durham_ic.R x NCNC_CaregiverData_clean.R x Untitled1* x NCNS_new.R x first90 x Inactive_Caregivers_Greensboro x Greensboro_ic.R x

```
1 # Clean the imported caregiver data
2 # Remove caregivers hired before 2012
3 # Remove caregivers with age less than 18
4 # Remove caregivers with duration of employment less than a week
5
6 r_ic=Inactive_Caregivers_Raleigh[Inactive_Caregivers_Raleigh$'Hiring Year'>2011,]
7 R_IC=r_ic[R_IC$'Hiring Year'<2018,]
8 r_ic=R_IC[R_IC$'Age on termination day ( in years)'>17,]
9 Raleigh_ic=r_ic[r_ic$'Duration of Employment (in days)'>7,]
10 View(Raleigh_ic)
11
12 # Converting data class of column 'Hiring Year' from integer to character
13
14 Raleigh_ic$'Hiring Year' = as.character(Raleigh_ic$'Hiring Year')
15
16 # Separate regression analysis for class, gender, age and hiring year
17
18 rlg.reg1=lm(Raleigh_ic$'Duration of Employment (in days)'~Raleigh_ic$'Class', )
19 summary(rlg.reg1)
20
21 rlg.reg2=lm(Raleigh_ic$'Duration of Employment (in days)'~Raleigh_ic$'Gender', )
22 summary(rlg.reg2)
23
24 rlg.reg3=lm(Raleigh_ic$'Duration of Employment (in days)'~Raleigh_ic$'Age on termination day ( in years)', )
25 summary(rlg.reg3)
26
```

21:1 (Top Level) R Script

Console

```
Call:
lm(formula = Raleigh_ic$"Duration of Employment (in days)" ~
    Raleigh_ic$Class)

Residuals:
    Min       1Q   Median       3Q      Max
-393.50 -172.01  -67.01   97.99 1647.26

Coefficients:
(Intercept)          268.0133    11.8325    22.6511 < 2e-16 ***
Raleigh_ic$ClassCNA14 136.7514    44.7357     3.0570 0.00232 **
Raleigh_ic$ClassCNA2   23.7220    44.7357     0.5300 0.59608
Raleigh_ic$ClassGEC   -63.0462    28.9038    -2.1810 0.02948 *
Raleigh_ic$ClassLPN   -12.2547    29.4517    -0.4160 0.67746
Raleigh_ic$ClassPCA   142.4867   126.3361     1.1280 0.25975
Raleigh_ic$ClassRN     0.7774    40.1461     0.0190 0.98456
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Environment History

Global Environment

Data	Observations	Variables
ASH_ic	88 obs.	of 17 variables
Cardinal_ic	66 obs.	of 17 variables
D_ic	749 obs.	of 17 variables
Durham_IC	749 obs.	of 17 variables
Durham_ic	760 obs.	of 17 variables
f90	620 obs.	of 4 variables
ff	7 obs.	of 6 variables
first90	936 obs.	of 4 variables
firstfew_2016	4 obs.	of 3 variables
firstfew_2017	4 obs.	of 3 variables
firstfew_2018	4 obs.	of 3 variables

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Home

Name	Size	Modified
UnivComparison.xlsx	12.1 KB	Jul 29, 2018, 6:14 PM
Shruti's Notebook.url	121 B	Jan 29, 2018, 1:26 PM
R		
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Greensboro

RStudio

File Edit Code View Plots Session Build Debug Profile Tools Help

Go to file/function Addins

```
Raleigh_ic.R x first90.R x Durham_ic.R x NCNC_CaregiverData_clean.R x Untitled1* x NCNS_new.R x first90 x Inactive_Caregivers_Greensboro x Greensboro_ic.R x Greensboro_ic x
Source on Save Run Source
2 # Remove caregivers hired in 2014, 2015 and 2018
3 # Remove caregivers with age less than 18
4 # Remove caregivers with duration of employment less than a week
5
6 g_ic=Inactive_Caregivers_Greensboro[Inactive_Caregivers_Greensboro$'Hiring Year'>2015,]
7 gboro_ic=g_ic[g_ic$'Age on termination day (in years)']>17,]
8 Gboro_ic=gboro_ic[gboro_ic$'Duration of Employment ( in days)']>7,]
9 Greensboro_ic=Gboro_ic[Gboro_ic$'Hiring Year']<2018,]
10 View(Greensboro_ic)
11
12 # Converting data class of column 'Hiring Year' from integer to character
13
14 Greensboro_ic$'Hiring Year' = as.character(Greensboro_ic$'Hiring Year')
15
16 # Separate regression analysis for class, gender, age and hiring year
17
18 gboro.reg1=lm(Greensboro_ic$'Duration of Employment ( in days)'~Greensboro_ic$'Class', )
19 summary(gboro.reg1)
20
21 gboro.reg2=lm(Greensboro_ic$'Duration of Employment ( in days)'~Greensboro_ic$'Gender', )
22 summary(gboro.reg2)
23
24 gboro.reg3=lm(Greensboro_ic$'Duration of Employment ( in days)'~Greensboro_ic$'Age on termination day (in years)', )
25 summary(gboro.reg3)
26
27 gboro.reg4=lm(Greensboro_ic$'Duration of Employment ( in days)'~Greensboro_ic$'Hiring Year', )
28 summary(gboro.reg4)
```

21:1 (Top Level) R Script

```
Console
lm(formula = Greensboro_ic$'Duration of Employment ( in days)' ~
  Greensboro_ic$Class)

Residuals:
    Min       1Q   Median       3Q      Max
-181.01 -114.76 -14.51   89.50  318.99

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)    197.013     15.021   13.116 < 2e-16 ***
Greensboro_ic$classCNA14  262.653     76.590    3.429  0.000877 ***
Greensboro_ic$classCNA2   -21.347     55.189   -0.387  0.699723
Greensboro_ic$classGEC    -7.013     76.590   -0.092  0.927221
Greensboro_ic$classLPN    47.987     41.999    1.143  0.255918
Greensboro_ic$classPCA   -31.013     93.200   -0.333  0.740004
Greensboro_ic$classRN     7.487     48.381    0.155  0.877333
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Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Environment	History
Global Environment	
crd.reg3	List of 12
crd.reg4	List of 13
durham.reg1	List of 13
durham.reg2	List of 13
durham.reg3	List of 12
durham.reg4	List of 13
f90.reg1	List of 13
f90.reg2	List of 13
firstfew_201...	List of 13
firstfew_201...	List of 12
firstfew_201...	List of 12
gboro.reg1	List of 13

Files	Plots	Packages	Help	Viewer
New Folder	Delete	Rename	More	
Home				
UnivComparison.xlsx				12.1 KB Jul 29, 2018, 6:14 PM
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ASH_caregivers.R				1.4 KB Jul 16, 2018, 11:43 AM
abc.url				121 B Jan 29, 2018, 1:03 PM
.Rhistory				14.5 KB Sep 14, 2018, 1:14 PM
.RData				722 KB Aug 9, 2018, 9:13 AM

Survey Analysis

Former Caregivers Survey

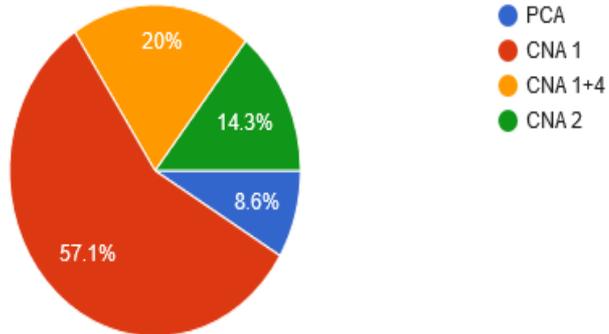


The Participants:

Total number=39

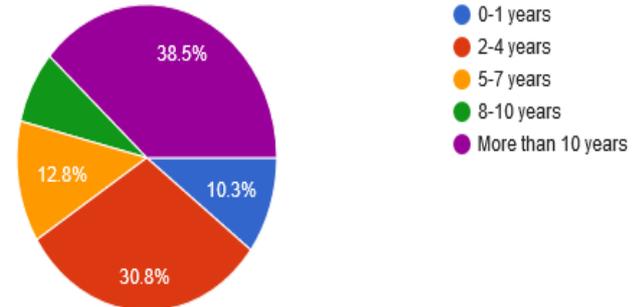
Certifications :

35 responses



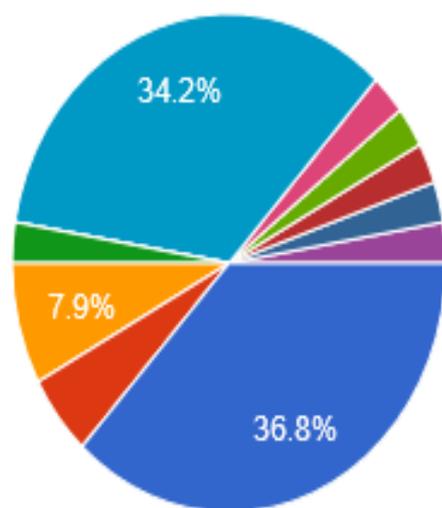
Years of Experience as a Caregiver:

39 responses



Question 7: What did you like most about your job at Nurse Care?

38 responses

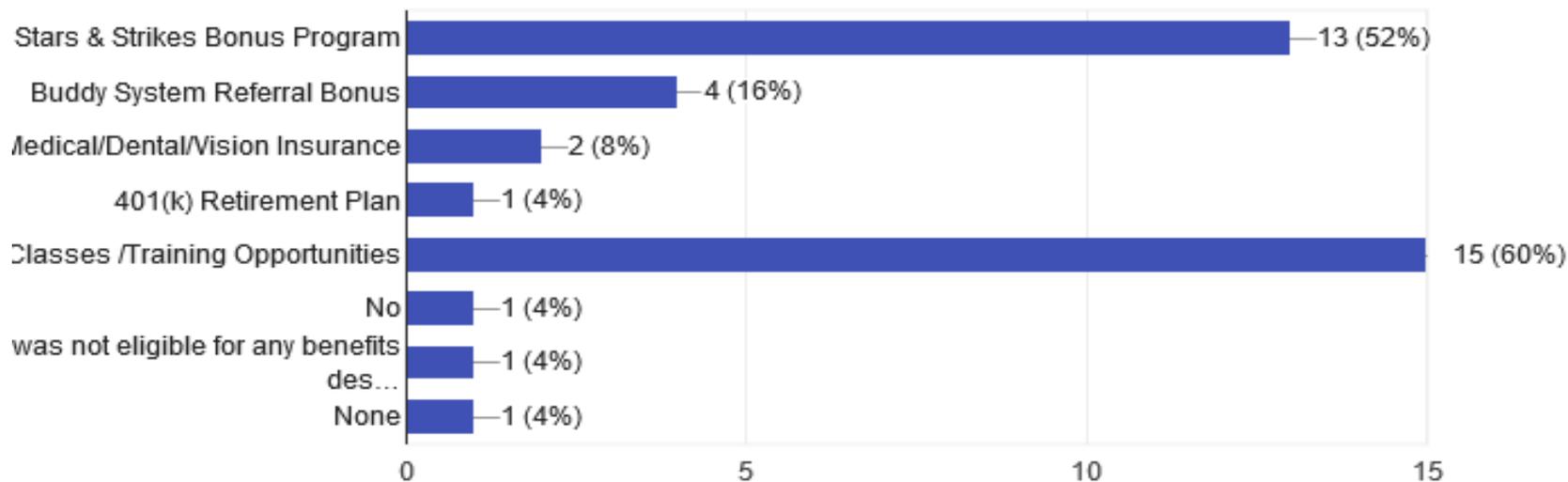


- Relationships with clients
- Relationships with other caregivers
- Company culture
- Bonus opportunities
- Relationships with office staff
- Schedule Flexibility
- Working for Ari, he's an awesome pe...
- None

▲ 1/2 ▼

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



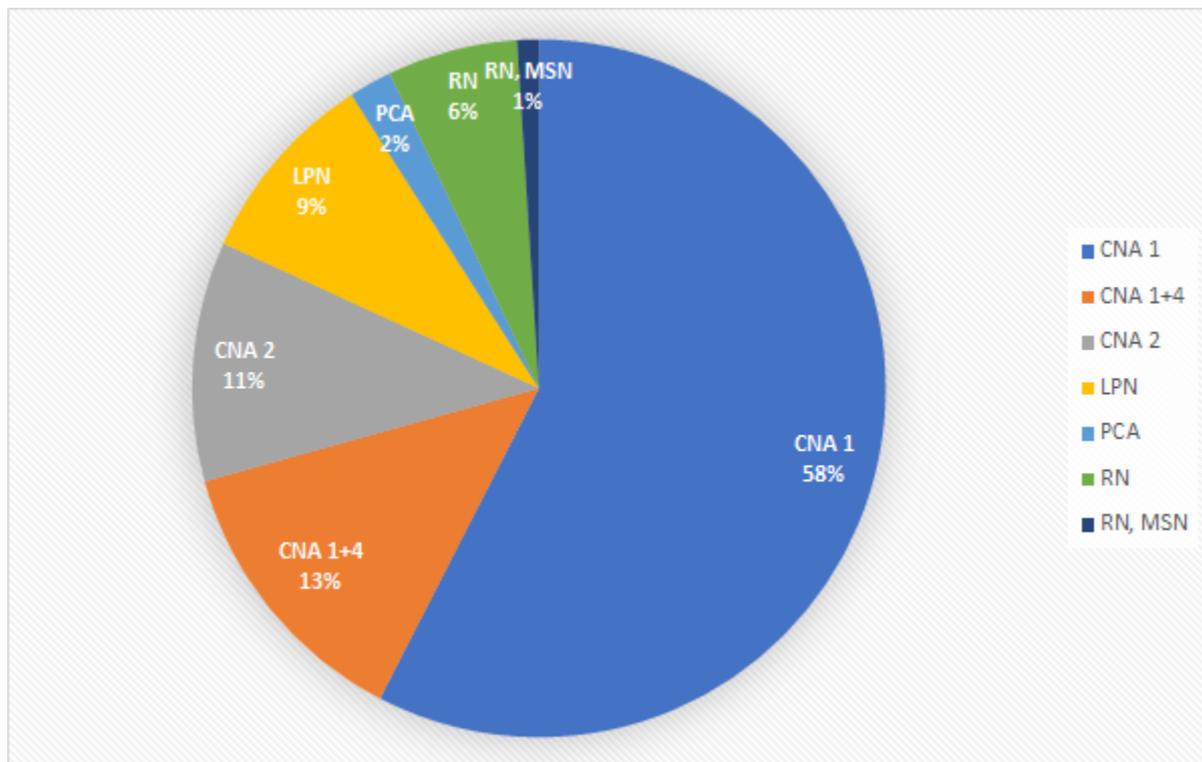
Significant Observations:

- 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

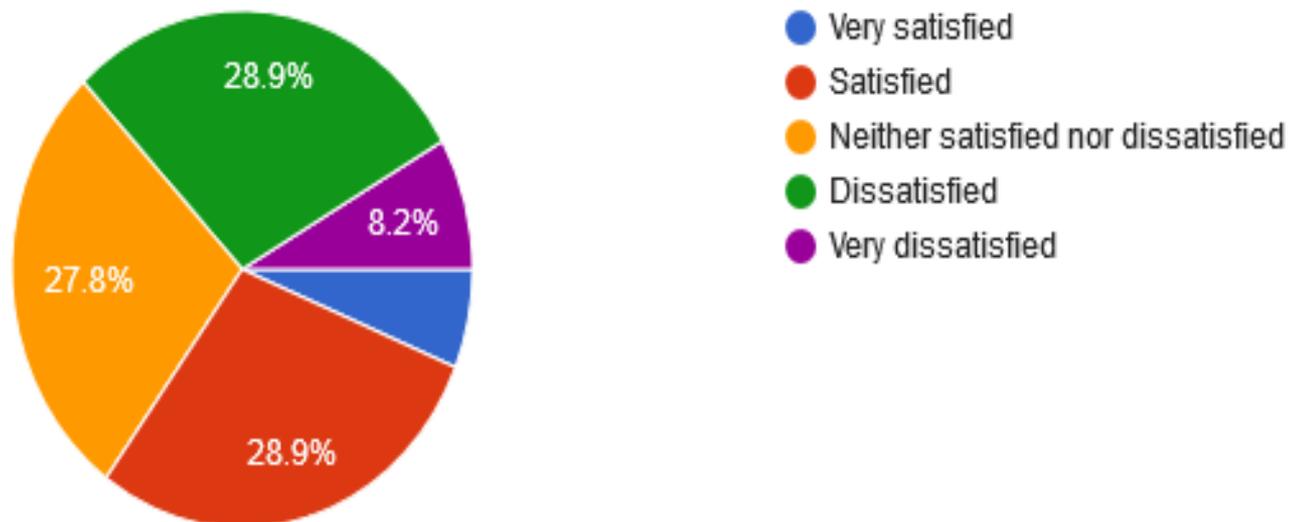
The Participants:

Total number=98



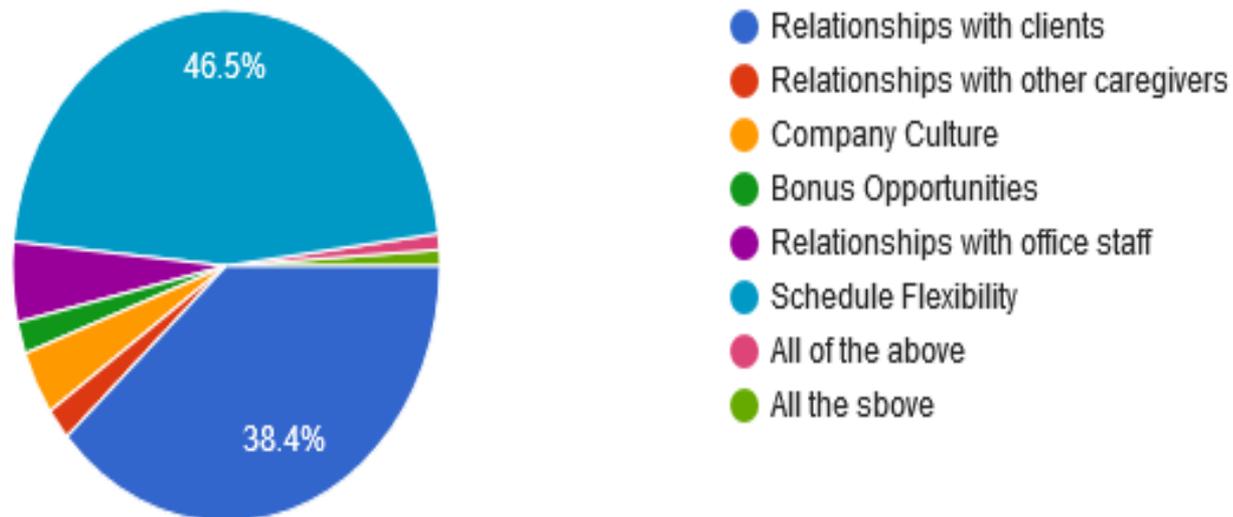
Question 3: How satisfied are you with the pay scale?

97 responses



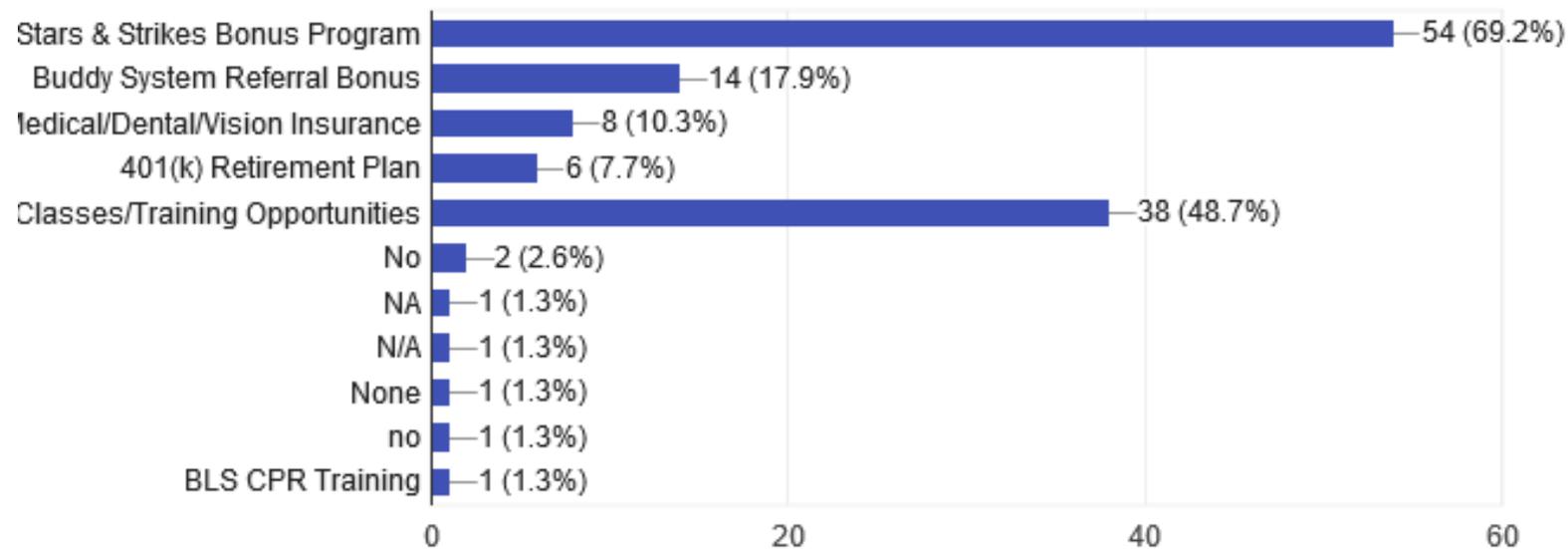
Question 7: What do you like most about your job at Nurse Care?

99 responses



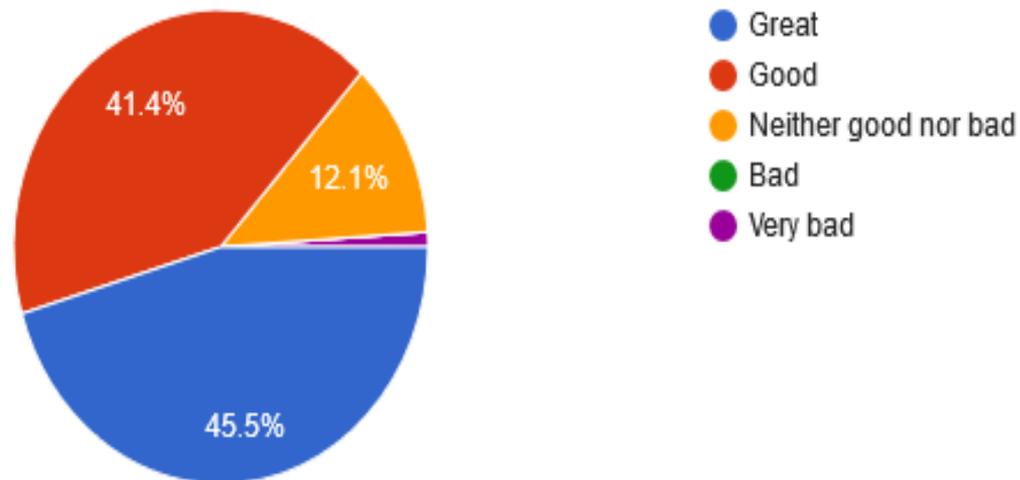
Question 9: Have you ever participated in any of the following Nurse Care benefit programs? If yes, select the appropriate options (select all that apply).

78 responses



Question 12: How has your overall experience with Nurse Care been to date?

99 responses



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

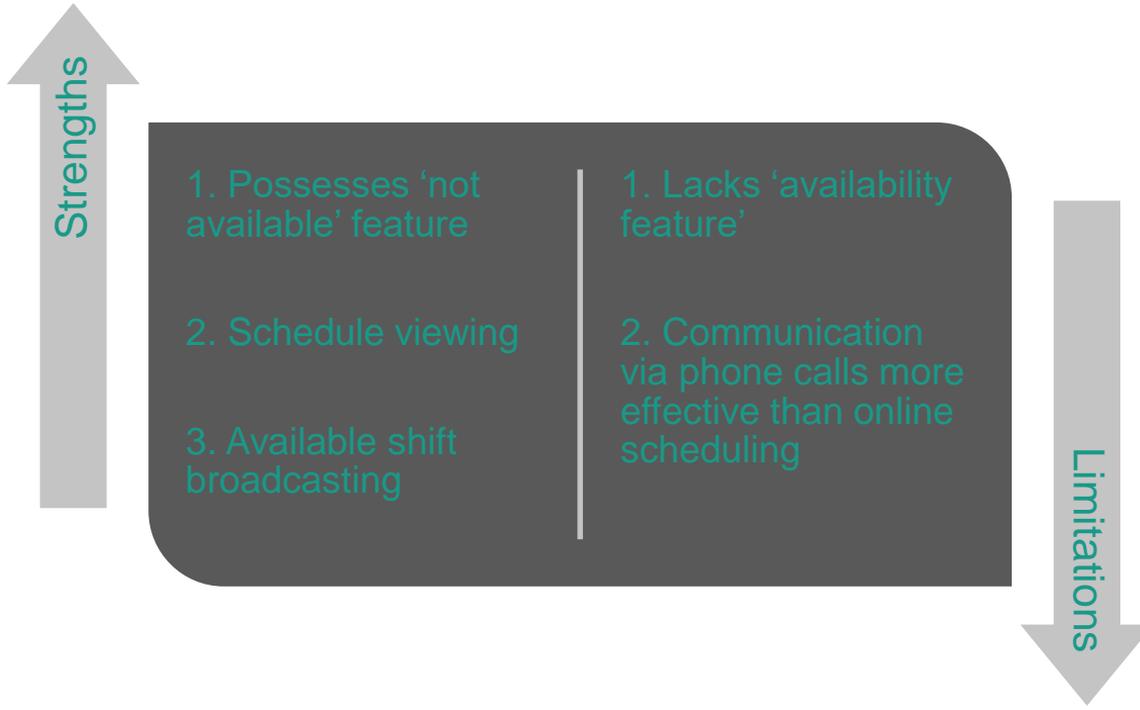
Prospective Caregiver Survey

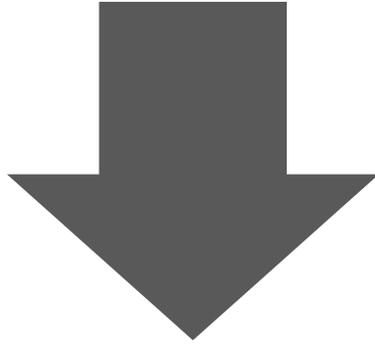
Significant Observations:

- 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





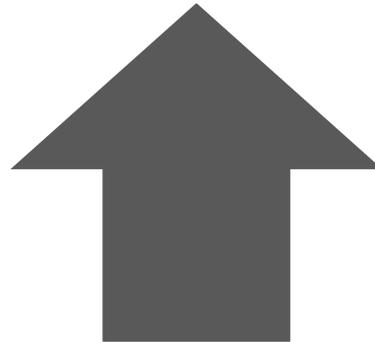
Data Analysis Limitations:

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:

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