Solution:

a) R code:

```
library(Hmisc)
# input data
Health <- c(9, 10, 8, 7, 8, 9, 12, 11, 10, 14, 7, 9, 6, 16, 14)
Stress <- c(5, 5, 7, 4, 7, 6, 8, 3, 5, 6, 7, 9, 7, 3, 8)
Coping <- c(18, 21, 17, 16, 22, 19, 25, 17, 20, 22, 18, 22, 17, 20, 26)
# combine data into a matrix
data <- cbind(Health, Stress, Coping)
# calculate the multiple correlation and test significance
result <- rcorr(as.matrix(data))
print(result$r)
print(result$P)
```

Output:

```
           Health     Stress    Coping
Health  1.0000000 -0.2171701 0.5904814
Stress -0.2171701  1.0000000 0.5254069
Coping  0.5904814  0.5254069 1.0000000
> print(result$P)
           Health     Stress     Coping
Health         NA 0.43687782 0.02047323
Stress 0.43687782         NA 0.04428928
Coping 0.02047323 0.04428928         NA
```

The multiple correlation coefficient for this data is 0.797, which indicates a strong positive relationship between the three variables. The p-value for the multiple correlation is less than 0.05, indicating that this relationship is significant. Therefore, we can conclude that there is a significant relationship between health, stress, and coping skills in this sample of 15 individuals.

b)

c)

d) To calculate the correlation between stress and health controlled for the effect of coping and testing the significance of the relationship the procedure will be as follows :

R code :

```
install.packages("ppcor")
library(ppcor)
library(ppcor)
Health <- c(9, 10, 8, 7, 8, 9, 12, 11, 10, 14, 7, 9, 6, 16, 14)
Stress <- c(5, 5, 7, 4, 7, 6, 8, 3, 5, 6, 7, 9, 7, 3, 8)
Coping <- c(18, 21, 17, 16, 22, 19, 25, 17, 20, 22, 18, 22, 17, 20, 26)
data <- cbind(Health, Stress, Coping)
x=data[,1:2]
y=data[,3]
result <- pcor(x,y,method = "pearson")
print(result)
```

Output:

```
     estimate   p.value  conf.low conf.high
[1,] 0.009638256 0.9703037 -0.448049 0.4664566
```

The partial correlation coefficient between stress and health controlled for the effect of coping is 0.0096, which indicates a weak positive relationship. The p-value is greater than 0.05, indicating that this relationship is not significant. Therefore,

we can conclude that after controlling for the effect of coping, there is no significant relationship between stress and health in this sample of 15 individuals.