출간오류

2023-08-25

파일 불러오기

```
setwd('C:\\Users\\phl02\\Desktop\\P\\bio_sas')
publica<- read.csv("data\\pb1.csv")
publica
```

```
##       study n1    m1   s1 n2    m2   s2
## 1    study1 12 28.20 0.90 11 35.90 1.40
## 2    study2  8 27.90 2.00 10 33.40 1.20
## 3    study3 10 27.90 2.30  9 36.10 2.70
## 4    study4 10 43.40 5.71  5 61.80 9.41
## 5    study5  9 53.10 7.88  5 61.90 8.40
## 6    study6  9  9.70 4.11 11  9.60 4.20
## 7    study7  6 10.33 4.50  9  8.11 7.39
## 8    study8  8 33.82 3.79  8 40.74 3.97
## 9    study9  9 36.21 1.72 10 41.32 4.07
## 10 study10  6 37.21 2.04 10 42.32 4.08
```

분석 진행

```
library(meta)
meta_pb <- metacont(n1,m1,s1,n2,m2,s2,data=publica,sm='SMD',
                        method.smd ='Hedges',study)
meta_pb
```

```
## Number of studies: k = 10
## Number of observations: o = 175
##
##                           SMD             95%-CI     z  p-value
## Common effect model  -1.3727 [-1.7536; -0.9918] -7.06 < 0.0001
## Random effects model -1.9111 [-2.9945; -0.8278] -3.46   0.0005
##
## Quantifying heterogeneity:
##  tau^2 = 2.6000 [1.0059; 11.5271]; tau = 1.6124 [1.0030; 3.3952]
##  I^2 = 83.6% [71.3%; 90.6%]; H = 2.47 [1.87; 3.26]
##
## Test of heterogeneity:
##      Q d.f.  p-value
##  54.79    9 < 0.0001
##
## Details on meta-analytical method:
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Q-Profile method for confidence interval of tau^2 and tau
## - Hedges' g (bias corrected standardised mean difference; using exact formulae)
```

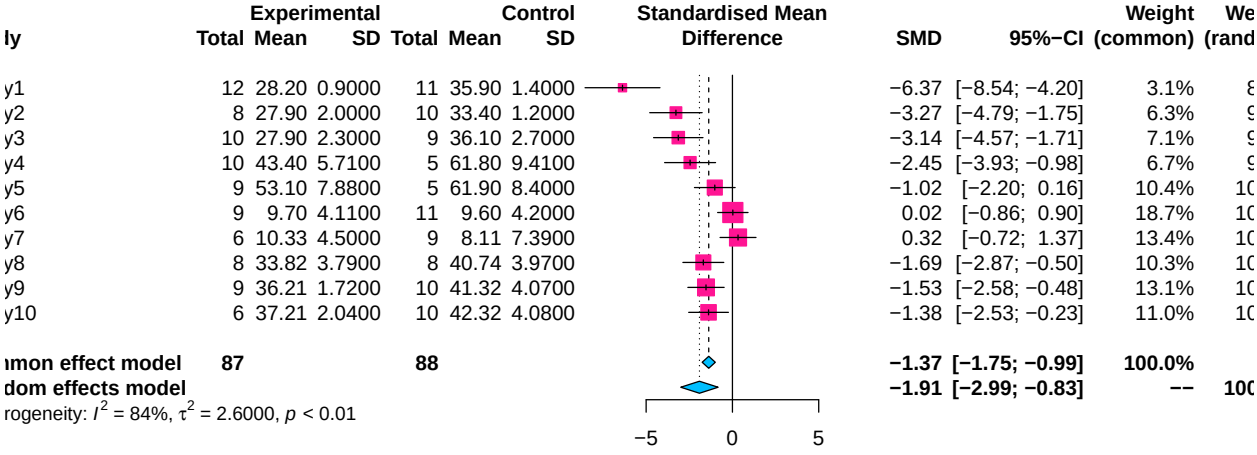
교정된 표준화된 평균 차이

```
smd <-1-2*pnorm(c(meta_pb$TE.random,meta_pb$upper.random,meta_pb$lower.random),0,1)
smd
```

```
## [1] 0.9440127 0.5922053 0.9972509
```

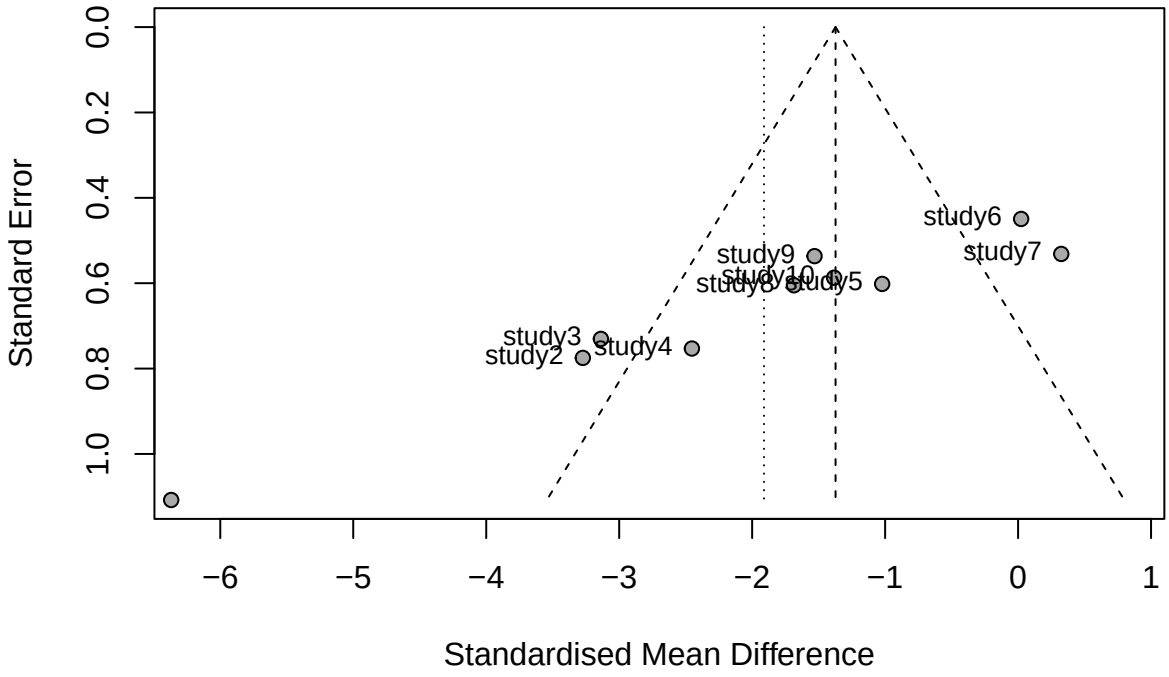
그래프

```
forest(meta_pb,
       col.diamond = 'deepskyblue1',col.square = 'deeppink1')
```



깔때기 그래프

```
funnel(meta_pb,studlab = T)
```



대칭성을 검정

```
metabias(meta_pb,method.bias = 'linreg')
```

```
## Linear regression test of funnel plot asymmetry
##
## Test result: t = -7.22, df = 8, p-value < 0.0001
##
## Sample estimates:
##     bias se.bias intercept se.intercept
##  -9.9727  1.3807    4.6080       0.8485
##
## Details:
## - multiplicative residual heterogeneity variance (tau^2 = 0.9105)
## - predictor: standard error
## - weight:    inverse variance
## - reference: Egger et al. (1997), BMJ
```

비뚤림 교정

```
library(metafor)
fsn(meta_pb$TE,meta_pb$seTE)
```

```
##
## Fail-safe N Calculation Using the Rosenthal Approach
##
## Observed Significance Level: <.0001
## Target Significance Level:   0.05
##
## Fail-safe N: 189
```

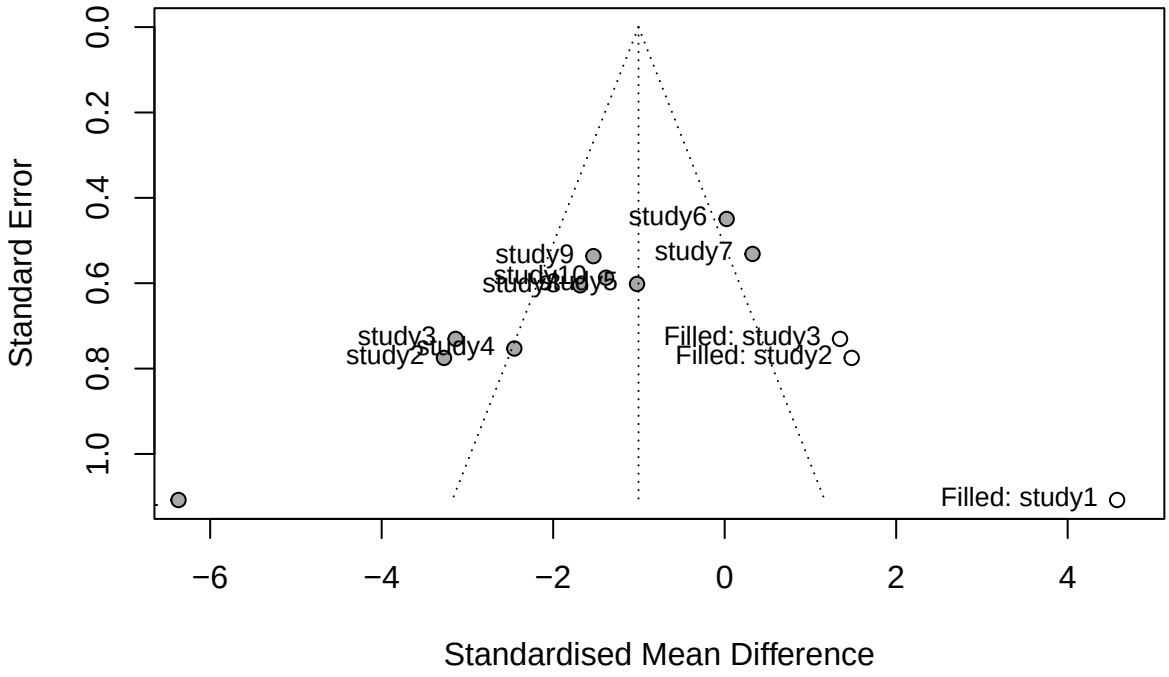
```r
meta_pb2 <- trimfill(meta_pb)
summary(meta_pb2)
```

```
##                     SMD             95%-CI %W(random)
## study1          -6.3691 [-8.5405; -4.1978]        6.9
## study2          -3.2734 [-4.7923; -1.7544]        7.6
## study3          -3.1375 [-4.5692; -1.7058]        7.7
## study4          -2.4531 [-3.9290; -0.9772]        7.7
## study5          -1.0222 [-2.2015;  0.1570]        7.9
## study6           0.0230 [-0.8580;  0.9040]        8.1
## study7           0.3247 [-0.7170;  1.3663]        8.0
## study8          -1.6855 [-2.8709; -0.5001]        7.9
## study9          -1.5310 [-2.5827; -0.4794]        8.0
## study10         -1.3837 [-2.5344; -0.2329]        7.9
## Filled: study3   1.3452 [-0.0865;  2.7769]        7.7
## Filled: study2   1.4811 [-0.0378;  3.0001]        7.6
## Filled: study1   4.5769 [ 2.4055;  6.7483]        6.9
##
## Number of studies: k = 13 (with 3 added studies)
## Number of observations: o = 235
##
##                          SMD            95%-CI     z p-value
## Random effects model -1.0047 [-2.3725; 0.3631] -1.44  0.1500
##
## Quantifying heterogeneity:
##  tau^2 = 5.7971 [2.7560; 18.7825]; tau = 2.4077 [1.6601; 4.3339]
##  I^2 = 88.5% [82.1%; 92.6%]; H = 2.94 [2.36; 3.67]
##
## Test of heterogeneity:
##       Q d.f.  p-value
##  104.03   12 < 0.0001
##
## Details on meta-analytical method:
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Q-Profile method for confidence interval of tau^2 and tau
## - Trim-and-fill method to adjust for funnel plot asymmetry (L-estimator)
```

```r
smd2 <- abs(1-2*pnorm(c(meta_pb2$TE.random,meta_pb2$upper.random,meta_pb2$lower.random),0,1))
smd2
```

```
## [1] 0.6849501 0.2834710 0.9823302
```

```
funnel(meta_pb2,studlab = T)
```



```r
metabias(meta_pb2,method.bias = 'linreg')
```

```
## Linear regression test of funnel plot asymmetry
##
## Test result: t = -0.48, df = 11, p-value = 0.6418
##
## Sample estimates:
##     bias se.bias intercept se.intercept
##  -1.6902  3.5338    0.1696       2.2946
##
## Details:
## - multiplicative residual heterogeneity variance (tau^2 = 9.2644)
## - predictor: standard error
## - weight:    inverse variance
## - reference: Egger et al. (1997), BMJ
```

```r
fsn(meta_pb2$TE,meta_pb2$seTE)
```

```
##
## Fail-safe N Calculation Using the Rosenthal Approach
##
## Observed Significance Level: <.0001
## Target Significance Level:   0.05
##
## Fail-safe N: 77
```

결과 정리

```
library(kableExtra)
result <- matrix(0,2,8)
colnames(result) <- c('k','ES','95% CI_low',
                      '95% CI_up','Q(df)','I^2','P','Fail-safe N')
row.names(result) <- c('    ','   trim-and fill ')
result[1,1] <- meta_pb$k
result[1,2] <- round(smd[1],3)
result[1,3] <- round(smd[2],3)
result[1,4] <- round(smd[3],3)
result[1,5] <- paste(round(meta_pb$Q,2),'(', meta_pb$df.Q,')')
result[1,6] <- round(meta_pb$I2*100,2)
result[1,7] <- round(meta_pb$pval.random,3)
result[1,8] <- round(fsn(meta_pb$TE,meta_pb$seTE)$fsnum,3)
result[2,1] <- meta_pb2$k
result[2,2] <- round(smd2[1],3)
result[2,3] <- round(smd2[2],3)
result[2,4] <- round(smd2[3],3)
result[2,5] <- paste(round(meta_pb2$Q,2),'(', meta_pb2$df.Q,')')
result[2,6] <- round(meta_pb2$I2*100,2)
result[2,7] <- round(meta_pb2$pval.random,3)
result[2,8] <- round(fsn(meta_pb2$TE,meta_pb2$seTE)$fsnum,3)
kable(result)
```

	k	ES	95% CI_low	95% CI_up	Q(df)	I^2	P	Fail-safe N
랜덤효과모형	10	0.944	0.592	0.997	54.79 (9)	83.57	0.001	189
수정된 trim-and fill모형	13	0.685	0.283	0.982	104.03 (12)	88.46	0.15	77