effect

2023-08-18

파일 불러오기

```
effect <- read.csv("C:\\Users\\phl02\\Desktop\\P\\bio_sas\\data\\con12.csv")
head(effect)</pre>
```

```
## study n1 m1 s1 n2 m2 s2 g
## 1 study1 7 23.3 4.30 6 39.0 7.40 0
## 2 study2 11 27.2 1.00 11 35.9 1.50 0
## 3 study3 9 28.9 2.10 10 33.4 1.30 0
## 4 study4 12 27.8 2.00 9 36.1 2.80 0
## 5 study5 10 43.2 5.73 5 61.8 9.37 0
## 6 study6 9 53.1 7.89 6 55.8 9.43 0
```

분석 진행

meta분석을 진행하는 패키지 중 하나가 'meta' 'metacont'명령어를 사용하여 분석을 진행

```
library(meta)
meta <- metacont(n1,m1,s1,n2,m2,s2,data=effect,sm='SMD',method.smd ='Hedges',study)</pre>
## Number of studies: k = 11
## Number of observations: o = 194
##
##
                            SMD
                                            95%-CI
                                                      z p-value
## Common effect model -1.3840 [-1.7411; -1.0269] -7.60 < 0.0001
## Random effects model -1.8765 [-2.8368; -0.9161] -3.83
##
## Quantifying heterogeneity:
## tau^2 = 2.1962 [0.8823; 9.7330]; tau = 1.4820 [0.9393; 3.1198]
## I^2 = 81.6\% [68.1%; 89.3%]; H = 2.33 [1.77; 3.06]
##
## Test of heterogeneity:
##
       Q d.f. p-value
          10 < 0.0001
## 54.21
##
## 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)
```

효과크기 확인

기본은 흑백이지만 가독성을 위해 색을 추가함

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

Study		Experim Mean		Total	Mean	Control SD	Standardised Mean Difference	SMD	95%-CI	Weight (common)	Weight (random)
study1		23.30 4.				7.4000	- - •		-4.03; -0.90]	5.2%	8.5%
study2 study3		27.20 1. 28.90 2.				1.5000			-8.85; -4.28] -3.76; -1.23]	2.4% 8.0%	6.7% 9.2%
study4	12	27.80 2.	.0000	9	36.10	2.8000	_ 		-4.78; -1.95]	6.4%	8.8%
study5	10	43.20 5.	.7300	5	61.80	9.3700		-2.48 [-3.97; -1.00]	5.8%	8.7%
study6	9	53.10 7.	.8900	6	55.80	9.4300) 	-0.30	[-1.34; 0.74]	11.8%	9.7%
study7	7	9.90 4.	.1200	11	10.60	4.2000	i 	-0.16	[-1.11; 0.79]	14.1%	9.9%
study8	8	9.35 4.	.5100	10	9.41	7.3900	 	-0.01	[-0.94; 0.92]	14.8%	9.9%
study9	7	33.85 3.	.8900	8	40.74	3.9700	- 	-1.65 [-2.87; -0.43]	8.5%	9.3%
study10	10	36.24 1.	.7300	11	42.33	4.0900	 	-1.83 [-2.88; -0.78]	11.5%	9.7%
study11	7	37.23 2.	.0500	10	41.32	4.1700		-1.12 [-2.17; -0.06]	11.5%	9.7%
Common effect model	97			97			♦	-1.38 [·	-1.74; -1.03]	100.0%	
Random effects model Heterogeneity: $I^2 = 82\%$, τ^2		962 n < 0	01				<u></u>	–1.88 [·	-2.84; -0.92]		100.0%
110.010gonotty. 1 = 0270, t	- 2.10	ο <u>υ</u> , ρ < υ.	.01				-5 0 5				

다이아몬드는 전체 연구를 종합한 평균효과크기 사각형은 개별 연구의 평균 효과크기

SMD값을 교정된 표준화된 평균 차이로 환산

[1] 0.83 0.70 0.92 0.94 0.64 1.00

결과 정리

```
library(kableExtra)
result <- matrix(0,2,8)</pre>
colnames(result) <- c('k', 'SMD', 'effect size', '95% CI_low',</pre>
                         '95% CI_up', 'p', 'Q(df)', expression(I^2))
row.names(result) <- c('Fixed', 'random')</pre>
result[,1] <- meta$n.e.pooled</pre>
result[1,2] <- round(meta$TE.fixed,2)</pre>
result[2,2] <- round(meta$TE.random,2)</pre>
result[1,3:5] <- Hedges[1:3]
result[2,3:5] <- Hedges[4:6]
result[1,6] <- meta$pval.fixed</pre>
result[2,6] <- meta$pval.random</pre>
for (i in 1:2){
  if (result[i,6] <0.001){result[i,6] <- '<.001'}</pre>
}
result[,7] <- paste(round(meta$Q,2),'(', meta$df.Q,')')</pre>
result[,8] <- round(meta$I2*100,2)
kable(result,format = 'latex')
```

	k	SMD	effect size	95% CI_low	95% CI_up	р	Q(df)	I^2
Fixed	97	-1.38	0.83	0.7	0.92	<.001	54.21 (10)	81.55
random	97	-1.88	0.94	0.64	1	<.001	54.21 (10)	81.55