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Meta-Analysis of Communication and Organizational Performance: Moderating Effects of Research Subject, Country and Year of Publication

Ali Katebi [1]*, Amir Masoud Saheli [2], Hafizullah Aghaei [3], Qasem Ahmadi [4]

Abstract
Communication plays a critical role in any sustainable plan or strategy. This meta-analysis was conducted to provide an overall perspective of the relationship between communication and organizational performance. A total of 999 articles in both English and Farsi were extracted from four databases. The random effects model was used to analyze the data. The analysis was done by CMA2 (V2.2.064). The results based on the random effects model illustrated that the degree of the relationship between communication and organizational performance is large, positive, and significant (R=0.745, CI=0.95 p=0.000%). Furthermore, "Research subject", "publication year" and "country" were identified as moderator variables in this relationship. An important jump in the intensity of this relationship was detected from 2017. Moreover, a significant difference in the intensity of this relationship was observed in educational organizations with commercial and medical organizations, which can be useful for activists in these fields. The intensity of the relationship in the countries of China, Malaysia, USA, South Korea, and Iran have been evaluated as significantly different. Therefore, these results can open new horizons for future research and especially the localization of international research results.

Keywords: *Communication, Organizational Performance, Meta-Analysis*

Introduction

Communication plays an essential role in changing attitude, awareness, clarification, and how to implementing strategies (Rahimi Firozabad et al., 2023)(Musheke & Phiri, 2021). Communication is an integral part of the organizational process that can impacts on the performance and decision-making of organizations. Organizational performance includes activities that effectively and continuously assist the, and efficiently help organizations to achieve their strategic goals and priorities (Richard et al., 2009) (Abesh Loui Aghdam et al., 2023). Several studies have been conducted in the field of the effect of communication on organizational performance and have provided conflicting results in such a way that some have reported the intensity of the relationship as high and medium and some have reported it as low (Yildirim, 2014) (Yap et al., 2018). (Abdollahbeig & Salehi, 2020) (Farmansyah & Isnalita, 2020) To overcome these inconsistencies in the findings and provide

[1]*. Assistant Professor, Department of Construction Engineering and Management, Faculty of Engineering, Kharazmi University, Tehran, Iran (Corresponding Author: katebi@khu.ac.ir)
[2]. Assistant Professor, Department of Construction Engineering and Management, Faculty of Engineering, Kharazmi University, Tehran, Iran
[3]. Master Student of Construction Engineering and Management, Faculty of Engineering, Kharazmi University, Tehran, Iran
[4]. Master Student of Construction Engineering and Management, Faculty of Engineering, Kharazmi University, Tehran, Iran

unified results, it seems necessary to conduct a meta-analysis study.

Several studies in the literature have examined the relationship between communication and organizational performance. Musheke and Phiri (2021) published an article in Zambia entitled Effects of Effective Communication on Organizational Performance Based on Systems Theory in the field of service companies in 2021, which expressed a largely positive relationship between communication and organizational performance (Musheke & Phiri, 2021). Moreover, another study Yap, Abdul-Rahman, and Wang (2018) entitled Excessive Preventive Reduction with Project Communication Management and Continuous Learning: The Medium Intensity PLS-SEM approach demonstrated that there is a significant relationship between communication management and project-based performance (Yap et al., 2018).

Another study conducted on textile sector by Osman Yildirim in turkey (2020) entitled the effect of organizational communication on the behavior and performance of organizational citizenship in this study has expressed a significant and positive relationship between communication management and citizenship behavior (Yildirim, 2014). In a different study of manufacturing companies in Malaysia, Abdollahbeiga et al (2020) reported that the relationship between communication system and organizational performance was insignificant and small (Abdollahbeig & Salehi, 2020). In a survey conducted by Farmansyah et al (2020) on communication technology and organizational performance in national organizations in Indonesia, the relationship between communication technology and organizational performance was insignificant (Farmansyah & Isnalita, 2020).

Although the large number of published articles on the relationship between communication and organizational performance indicates the importance of this issue, however, no meta-analysis studies were found in this regard. The conflict between the results of past research makes it necessary to conduct a meta-analysis study. Examining the variables of "publication year", "Research subject" and "country" as moderators of the relationship between communication and organizational performance is another innovation in this research. Therefore, the results of this study will be useful for the managers of different industries to develop strategies to improve the performance of the organization. Furthermore, the results of this research can be used by researchers from different countries to localize international research related to communication and organizational performance.

The purpose of this research is to review the articles published in the period from 2012 to 2021 about the impact of communication on organizational performance and to identify the moderating variables of this relationship. In this study, in Section 2, the literature is presented. In Sections 3 and 4, the methods and results are demonstrated. In Section 5, the discussion and conclusion are presented.

Literature Review

Organizational communication is essential for the success of an organizational accelerator, and the failure of these organizations is often the result of ineffective communication, intra-organizational communication focuses on how the employees of the organizational accelerator interact with each other (Hasanpuor et al., 2023). Communication with the main suppliers could guarantee the success of the supply chain process. Defined as" the mutual expectation of formal and/or informal sharing of information", communication is "a meaningful and timely exchange of relationship between partners". This implies that the regular flow of information between buyers and suppliers ensures the effectiveness of production and delivery of products/services at the right time (Oduro et al., 2020) (Oduro et al., 2020) (Ekhlasmand et al., 2023). Communication strategy plays

an important role in teaching, disseminating knowledge, and learning during the communication process (Hilman & Siam, 2014). Experienced respondents pay more attention to the quality of communication. The issue of communication management occurs 4.5 times more often in effective projects than in ineffective ones (Forcada et al., 2017).

Communication positively affects followers' satisfaction and ultimately decisively affects performance and satisfaction. Many organizations attempt to adopt a variety of systems to measure organizational performance (Sabino et al., 2021)(Ehsani & Mehrmanesh, 2021). Monitoring and guiding these systems optimize the outcomes and promote purposes and practices compatible with human resources (Hilman & Siam, 2014). Research illustrates that there is a direct relationship between several organizational outcomes such as employee commitment, performance, and behaviors, and social responsibility (Ehsani & Mehrmanesh, 2021; Sirafi Nafis et al., 2022).

Effective communication can encourage employees to improve their work environment through positive partnerships (Musheke & Phiri, 2021). The information provided by experts permits the leaders to have sufficient knowledge to make appropriate decisions and closely monitor the emerging issues (Dutton & Ashford, 1993). Analysis of the result of Felix C. Brodbeck demonstrated that high communication greatly facilitates project performance in the later stages of the project life cycle, when there is little standardization of methods and tools (Brodbeck, 2001). The main goal of this research study on investigating the effect of communications on organization performance, leads to the following main hypothesis is tested as the first hypothesis.

H1: Communication is related to organizational performance

While the relationship between communication and performance in research in China was reported to be low, in another research in Ghana, the intensity of this relationship was found to be high (Wang & Huang, 2020) (Fu & Lai, 2021). Moreover, the relationship between communication and organization performance in research with statistical population of hospitals has been reported to be low, but another research in the educational statistical population, the intensity of this relationship has been high (Oduro et al., 2020). In addition, the research process reported in different years demonstrated the intensity of the relationship between communication and organizational performance, which revealed a significant increase in the years 2016 and 2017 (Lee et al., 2017).

H2: The relationship between communication and organizational performance changes significantly in recent years.

H3: The relationship between communication and organizational performance varies significantly across countries.

H4: The relationship between communication and organizational performance varies significantly in different research subjects.

Research Methodology

Quantitative research is a difficult too important and can, in addition to expanding the literature in studies provide useful insights into developing theories. Qualitative studies are not currently generalizable. The research studies built upon conceptual frame works could identify scientific gaps and provide further information for research programs and researchers (Singh et al., 2020). Further studies are appropriate to examine general issues (Srivastava et al., 2020). Bibliometric studies offer a macro perspective by evaluating analytical quantitative methods for describing, monitoring, and publishing research and providing a clear, systematic, and statistical view of studies (Singh et al., 2020). These methods do not provide a synthesis of previous results. Whereas experimental studies focus more on classification, descriptive statistics, and identification of

future research programs, meta-analysis results associated with statistical measurements and techniques are highly acceptable (Srivastava et al., 2020). The meta-analysis method is used when the results of several independent studies are presented to test a selected hypothesis and these results are analyzed (Wampold et al., 2000). Meta-analysis is less biased than other reviews because it is systematic (Rosenbusch et al., 2011). The process of performing a meta-analysis involves the full investigation of previous studies. In the following step, the data extracted from the studies that have been identified as appropriate based on a specific protocol are integrated. After analyzing the data, various factors such as homogeneity or heterogeneity, bias, and moderating variable are examined (Borenstein et al., 2010). The next step is to perform the necessary examinations and analyses, the results of which are reported as the effect size. The value that illustrated the magnitude of the relationship between the two variables is the effect size. Additionally, there is a need for defining the criterion as the observed effect for readers to make the right decision from a scientific point of view, there must be a suitable criterion. This criterion is the observed number of effects, which is a small amount that must be reported by scientific processes (Annison, 2011). Cohen also developed a measure of Effect size in review research in 1992, then summarizes the output of a particular research topic. Cohen has provided a criterion for describing and reporting the Effect size. Based on this criterion, the effect size which is equal to 0.1 illustrates a low correlation, 0.3 illustrates a medium correlation, and 0.5 illustrates a high correlation. Moreover, a p-value less than 0.05 demonstrates the significance of the relationship and when the p-value greater than 0.5 indicates the absence of a significant relationship (Graham & Mueller, 1949a).

Searching and Selecting Articles

The use of specific selection protocols is required because the selection of the article affects the outcome (Rosenbusch et al., 2011). There are different types of biases. An approach to avoid selection bias and a specific and standard protocol has been used as one of the most important factors in meta-analysis is article selection bias. This type of bias occurs when the researcher selects articles with personal judgment and opinion, which follows the protocol described in Table 1. Another type of bias is language bias. To overcome this bias, the articles were searched in both English and Persian in November 2021 Search for English articles in SCOPUS, ASCE, and ScienceDirect databases and Persian articles in Magiran database. The description of each database for English and Persian articles, illustrated in Tables 2 and 3. The published articles were searched between 2012 and 2021. 658 articles were found by searching ASCE, SCOPUS, ScienceDirect databases and 341 articles were extracted by searching Magiran. Thus, a total of 999 articles were found in the entire database. Only the articles that are scientifically valid and published in journals were considered. Other types of articles such as conference papers, manuscripts, reviews, polls, and books were excluded. (Only published articles and in-press articles were considered. By removing duplicate articles, the number reached 960. The articles that were not accessible via databases for various reasons were not taken into account. They were removed from the database and blacklisted). Therefore, by removing them, the number of available articles reached 860.

In the next step, the received articles were divided into two categories: quantitative and qualitative categories. Since meta-analysis is systematic research, qualitative articles were excluded and only 526 articles were reviewed. In the next stage, 309 articles were omitted as they were removed because they had nothing to do with were irrelevant to our hypothesis. The relevant articles to our hypothesis reached 25 articles. Then, the articles that did not report validity and reliability and the articles that applied incorrect results were excluded. Finally, 15 articles remained. The article selection procedure is illustrated in Figure 1.

Table 1.
Article Selection Protocol

#	Protocol Step
1	Search the articles published between 2012 and 2021
2	How and where to search the keywords
3	Choose English and Persian to search the article
4	Searching only among the published articles and articles of the authentic scientific journals (Article and Article in Press)
5	Remove the duplicate articles
6	Exclude the inaccessible articles
7	Remove the qualitative articles
8	Removing articles that the texts or hypotheses of them are not relevant to the issue
9	Removing articles that do not contain appropriate validity and reliability or have not reported them
10	Removing articles that have applied incorrect tests

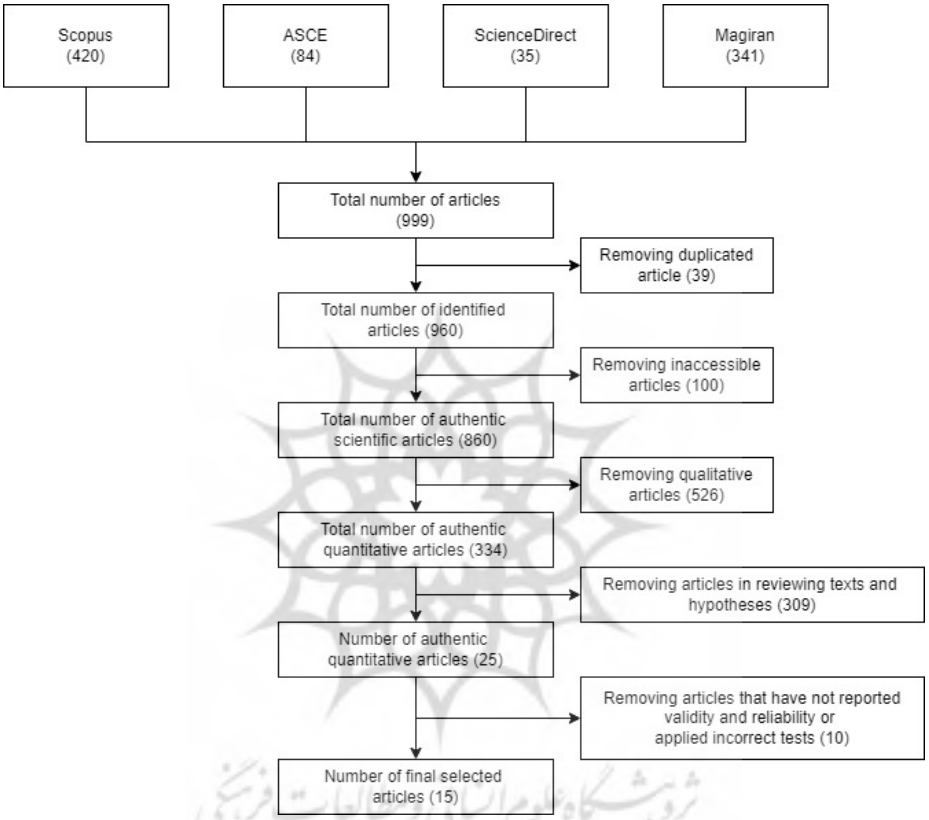

Figure 1. *The process of article selection*

Table 2.
Search Methods in English Language Databases

#	Database	Keyword 1	Keyword 2	Logical Operator	Search Field of Keyword 1	Search Field of Keyword 2
1	ScienceDirect	Communication	Organization Performance	AND	TKA*	TKA
2	Scopus	Communication	Organization Performance	AND	TKA	TKA
3	ASCE	Communication	Organization Performance	AND	TKA	TKA

** Title, Keywords & Abstract*

Table 3.
Search Methods in English Language Databases

#	Database	Keyword 1	Keyword 2	Logical Operator	Search Field of Keyword 1	Search Field of Keyword 2
1	Magiran	ارتباطات	عملکرد سازمانی	AND	TKA	TKA

Data Extraction

The following pattern was used to extract the data from the articles after the final articles were identified, and with the information and results obtained from the articles in hand:

1) Correlation coefficient and sample size
2) Correlation coefficient and t-value
3) Correlation coefficient and standard error (SE)

In addition, in some papers, the β coefficient was reported instead of the correlation coefficient. Based on the literature, a formula for converting the β factor into Pearson correlation has been proposed (Peterson & Brown, 2005). Accordingly, Formula 1 was used to convert these coefficients into a correlation coefficient.

Formula 1

$$r = 0{,}98\beta + 0{,}05\lambda \begin{cases} if\ \beta > 0 \rightarrow \lambda = 1 \\ if\ \beta < 0 \rightarrow \lambda = 0 \end{cases}$$

Data Analysis

Meta-analysis measures the relationship between the two variables and the effect size (Kelley & Preacher, 2012). According to studies, Cohen (1992) provided an indicator to represent the effect size (Graham & Mueller, 1949a). Based on this index, an effect size of 0.5 means a large relationship. 0.3 means a medium relationship, and 0.1 means a small relationship (Graham & Mueller, 1949). If P-Value is greater than 0.05, it does not illustrate the significance of the relationship. Moreover, if P-Value is less than 0.05, the significance of the relationship remains constant. To perform the statistical test, ensure data homogeneity, and calculate the effect size, software version 2 (CMA2) comprehensive meta-analysis of data homogeneity and also the importance of effect size of vital issues in the meta-analysis were used (Rosenbusch et al., 2011).The results in the meta-analysis method are classified based on two models: fixed effects and random effects (Shaik & Dhir, 2020). The "fixed effects model" assumes that the data obtained for the meta-analysis is driven by a statistical community and are homogeneous. Due to the heterogeneity of the data, one of these two models is applied. If the results of the Cochrane's Q and I2 tests illustrated that the data are homogeneous, the fixed effects model should be employed (Shaik & Dhir, 2020). If the data are reasonably heterogeneous, the "stochastic effects model" will be applied (Borenstein et al., 2010). In this model, it is assumed that the data entered into the meta-analysis are obtained from different statistical populations, and are random and heterogeneous (Shaik & Dhir, 2020). T-Value and Q-Value can be obtained from the Cochrane's test. According to the p-value obtained from this test if this value is less than 0.05, it illustrates that the data are heterogenous between the data and the random-effects model should be used. However, if the p-value is higher than 0.05, the fixed effects model should be considered (Borenstein et al., 2010) (Grant & Hunter, 2006). Based on the literature, it could be concluded that the I2 test can be used as a useful indicator to examine heterogeneity in studies. When the index is above 50%, significant heterogeneity could be observed. Different biases are discussed as part of the points of in this study. Language bias, selection bias, citation bias, and publication bias are investigated in the present study. Language bias refers to the lack of familiarity with other languages that may lead the researcher to use a particular language and exclude research studies published in different languages, which means linguistic bias (Egger et al., 1997).

The required method has been used to overcome language bias from different languages. Therefore, two different languages (English and Persian) have been used in the present study to prevent language bias. Selection bias occurs when the researcher includes or excludes the studies based on personal judgments (Egger et al., 1997). A standard appropriate protocol has been used to counteract the selection bias. Citation bias is observed when researchers use only one database or journal to receive

articles (Jannot et al., 2013). To avoid citation bias, the articles in four databases have been reviewed and the magnitude of the effect reported in this meta-analysis has not been considered.

Another type of bias is publication bias. According to the literature, the articles with small effect sizes are less likely to be published than those with large or medium effect sizes. Researchers are generally reluctant to publish low-volume articles. This is called publication bias (Egger et al., 1997). This type of bias is checked by the Egger test and the funnel plot. The "funnel plot" is a graphic diagram with larger studies at the top, and smaller studies at the bottom of the funnel. Furthermore, the size of the effect on the horizontal axis is demonstrates horizontally, and the size or weight of the studies is illustrated vertically. If the studies are similar and distributed on both sides of the funnel, said it could be concluded that the research has no publication bias. If the p-value in the Egger test is less than 0.05, it means that there is a publication bias in our research results (Borenstein et al., 2010). The Duval and Tweedie methods illustrated the fitting results. The correction of the funnel plot illustrated that if there is no publication bias, the diagram around the summarized line will be symmetrical. When the number of studies on one side of the graph is greater than the number on the other side of the graph, it is concluded that these studies have been omitted from the other side. Tweedie analyzes the omitted studies and includes a recalculation of the size of the work (Borenstein et al., 2010). The N-test is error-free to judge the robustness of the results against publication bias (Rosenbusch et al., 2011). This test illustrated that more studies need to be done to underscore the importance of the meta-analysis results added to the study set. Some studies (Rosenbusch et al., 2011) demonstrates that if the safe N is greater than 500, the meta-analysis results are unlikely to change (Rosenbusch et al., 2011) (Rosenthal, 1986).

Research Results

Introduction The reason and necessity of this meta-analysis on the relationship between the communications faction and organizational performance has been previously discussed. The sections provided a summary of the results of previous studies and a review of the literature. Applied the tests the researchers used in this study along with descriptive and inferential statistical research methods are described in this section. The process of searching and omitting the articles is demonstrated in descriptive statistics followed by the necessary information about the selected articles. Databases include search keywords, article languages, publication years, their statistical populations, and study locations, and many articles from the beginning of the search to the final stages of the article deletion protocol. Inferential statistics are also employed to describe the details about the articles more accurately and obtain the results of independent analyses and experiments.

The Specifications of the Selected Articles

As described in the "Research Methods" section, a specific protocol was used to select the articles. Out of 999 articles, 15 articles were selected with the remaining 16 data. The selected articles comprised various statistical populations such as bank employees, supervisors, commercial company employees, accounting company employees, faculty members of employees' universities, public sector hospital employees, etc. The articles were published from 2012 to 2021 and the research studies were conducted in countries such as Iran, Taiwan, China, Germany, USA and Malaysia, Serbia. The data collection tools that were used included a questionnaire and survey. These articles have been selected from more than one data source and sample size due to the type and number of the reported data.

The Statistics of the Selected Articles

Based on the meta-analysis and systematic review protocols, a report of the specifications of the articles after identification based on it is provided the main features of the selected articles were reported. Before this process, finally, Pearson correlation coefficient, homogeneity tests, dual correction fits, and Tweedie's method examined biases, especially publication bias with Egger test and funnel plot and N-test error-safe analysis of moderator variable identification in this Section is presented. The obtained results such as point estimation, high limit, low limit, p Values, Z-Values, and effect size are illustrated in Table 4. Some articles were considered in more than one row because more than one row of acceptable data was extracted from them.

The Meta-analysis Results

In a meta-analysis, the relationship between two variables and the effect size is measured (Kelley & Preacher, 2012). The meta-analysis illustrated a significant relationship between communication and job performance. Stochastic effects and fixed-effect models obtained from the results of the analyzes are illustrated in Table 5. The appropriate effects model is selected by identifying the homogeneity or heterogeneity of the selected data. Homogeneity of Q Cochrane's and the I2 test, which are the results of data analysis, is also discussed to select the fixed effects or stochastic effects model.

Table 4.
Studies Statistics

#	First Author's name	Reference	Point Estimate	Lower Limit	Upper Limit	Z-value	P-value
1	Jerman	(Jerman & Završnik, 2012)	0.772	0.566	0.887	5.233	0.000
2	Saim	(Siam, 2017)	0.769	0.559	0.886	5.157	0.000
3	Shirin	(Shirin et al., 2018)	0.536	0.399	0.651	6.636	0.000
4	Hilman	(Hilman & Siam, 2014)	0.768	0.558	0.886	5.157	0.000
5	Gulshan	(Ehsanfar & Garousi, 2016)	0.766	0.557	0.884	5.186	0.000
6	Oduro	(Oduro et al., 2020)	0.758	0.541	0.881	5.024	0.000
7	Jabarzadeh	(Jabarzadeh et al., 2019)	0.750	0.531	0.875	5.011	0.000
8	*Bonyadi*	(Bonyadi Haini et al., 2016)	0.766	0.511	0.897	4.430	0.000
9	Wang (data 1)	(Wang & Huang, 2020)	0.753	0.532	0.878	4.973	0.000
10	Wang (data 2)	(Wang & Huang, 2020)	0.754	0.534	0.878	4.980	0.000
11	Lee	(Lee et al., 2017)	0.750	0.521	0.879	4.818	0.000
12	Fu	(Fu & Lai, 2021)	0.741	0.519	0.869	4.948	0.000
13	Daud	(Daud et al., 2018)	0.748	0.531	0.873	5.037	0.000
14	Farmansyah	(Farmansyah & Isnalita, 2020)	0.751	0.534	0.875	5.049	0.000
15	Suleimanejad	(Suleimanejad et al., 2018)	0.744	0.523	0.872	4.950	0.000
16	Abdollahbeig	(Abdollahbeig & Salehi, 2020)	0.745	0.517	0.874	4.851	0.00

Heterogeneity was observed in the studies (Q test: P = 0.000 and I2 = 99.315%) indicate that the data were random). Therefore, in this study, a random-effects model was used. The stochastic effects model illustrated that the research was not the same, but was done randomly (Borenstein et al., 2010). The value of the effect obtained for this relation is (p = 0.000, CI=95%) As mentioned, Cohen (1992) defined the effect size of 0.1 as small, 0.3 as medium, and 0.5 as large effect size (Jing, 2018). According to this criterion and in confirmation of hypothesis H1, the effect size obtained is more than 0.5 which is a large effect size. Furthermore, the value of obtained P less than 0.05 with the average effect size indicates the importance and significance of this relationship.

Table 5
The Results of Analysis Using Stochastic and Fixed Effects Models

Model Type	Point Estimate	Lower Limit	Upper Limit	Z-value	P-value
Fixed-effects	0.443	0.422	0.464	36.33	0.000
Random-effects	0.745	0.536	0.868	5.198	0.000

Biases and Statistical Stability (Significance)

The stability of the study's findings was assessed using the fail-safe N test, which provides an indication of the robustness of the results. In this study, the fail-safe N number, as calculated by Rosenthal, was determined to be 7830. This means that at least 7830 additional studies would need to be included in the analysis to significantly alter the results. According to Rosenberg (2005), studies with a fail-safe N number exceeding 500 are considered highly credible. Therefore, the present research will remain valid for an extended period. Additionally, a fail-safe N number greater than 625, as suggested by Rosenthal (1986), confirms the stability of the study. To mitigate language, selection, and citation biases that could influence the research outcomes, the research protocol outlined in the research methodology was implemented. However, the presence of publication bias in the study was revealed through the funnel plot and the results of the Egger test. The distribution of studies exhibited asymmetry, and both the single-domain and double-domain values obtained from the Egger test were less than 0.05. This indicates a significant presence of publication bias in the study (P-value = 0.000). Furthermore, the results obtained from Duval and Tweedie's correction fitting support these findings as statistical evidence. (Borenstein et al., 2010).

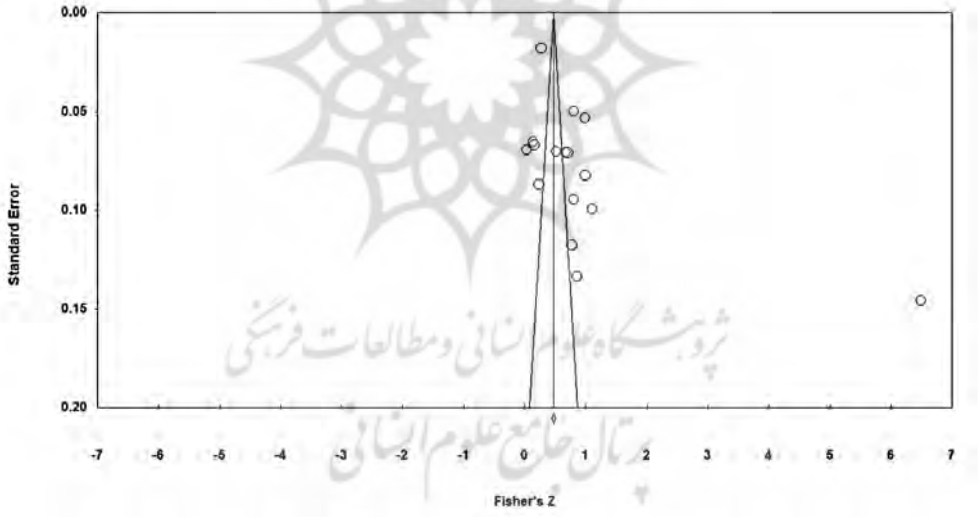

Figure 2. *Funnel plot of standard error by Fisher's Z and examining the symmetry of the studies*

Identifying the Moderator Variable

The modifier is a variable that can affect the direction or extent of the relationship between the main variable and the intermediate variable (Borenstein et al., 2010). Identifying the modifier variable in meta-analytic studies with selected data from several different articles offers a correct understanding of the data scattering factor. One of the ideal solution important goals of meta-analysis studies is an attempt to find the moderator variable. The countries in which the studies were conducted, the year of publication, and the target population were examined to find the moderator variable. Necessary analyses by the software were reviewed and applied using a random-effects model. This issue was investigated in different countries including America, China, Iran, Indonesia, Malaysia, and Palestine, Ghana, which confirmed the H3 hypothesis. By examining the years 2012 to 2021, taking

into account the results of the H2 hypothesis, it was confirmed. In addition, after examining the research topic including marketing and education, the H4 hypothesis was found to be acceptable. Finally, the topic of the research, the year of publication and the country as an observer were confirmed.

Table 6.
Results of Moderator Variables Using Random Effects Model

Moderator	Q_B	Level	K	r	95% CI	Z-value
Research subject (K=16)	68.094					0.000***
		Education	5	0.937	0 196to 0.997	2.217***
		Hospital	1	0.474	0.360 to0.574	7.318
		Service Company	1	0.804	0.723 to 0.863	11.154***
		Marketing	3	0.184	0.030 to 0.329	2.331
		Business	5	0.667	0.594 to 0.730	12.854***
		Government	1	0.647	0.492 to 0.762	6.536
Country (K=16)	161.716					0.000**
		China	2	0.598	0.531 to 0.657	13.785***
		Malaysia	3	0.577	0.048 to 0.853	2.113*
		Indonesia	1	0.647	0.492 to 0.762	6.535***
		Ghana	1	0.474	0.360 to 0.574	7.318***
		Iran	5	0.942	0.396 to 0.996	2.575**
		South Korea	1	0.667	0.609 to 0.718	16.106***
		Slovenia	1	0.030	-0.105 to 0.165	0.439
		USA	1	0.804	0.723 to 0.863	11.154***
		Palestine	1	0.158	0.027 to 0.282	2.367*
Years (16)	11.183					0.000***
		2012	1	0.030	-0.105 to 0.165	0.439
		2014	1	0.158	0.027 to 0.282	2.367*
		2016	2	0.266	0.234 to 0.297	15.570***
		2017	4	0.971	0.388 to 0.999	2.434*
		2018	1	0.693	0.531 to 0.806	6.389***
		2019	1	0.668	0552 to 0.758	8.533***
		2020	6	0.659	0.546 to 0.748	8705***

Discussion

The present meta-analysis was performed to analyze the results of previous studies on the relationship between communication and organizational performance. The articles were selected from 4 databases in both Persian and English. Finally, 16 separate data were extracted by following a systematic and specific protocol. The surveyed studies were published between 2012 and 2021 and conducted in different countries and continents. According to these studies, a stochastic effects model was considered for data analysis in this study. Data heterogeneity was examined by the Cochran Q test and the citation propagation bias was investigated by the funnel plot and Egger test. All statistical tests were performed by CMA2 (V2.2.064) software. Finally, the relationship between communication and organizational performance was considered to be significant (sig = 0.01) and strong (R = 0.745) based on Cohen's (1992) criterion.

The result of the present meta-analysis was confirmed by the results of the following studies. The correlations reported by Marlow et al (2018) strongly approved the present results (Marlow et al., 2018). Musheke study on effective communication and organizational performance with strong intensity confirmed this relationship (Musheke & Phiri, 2021). In another study, Ebarefimia et al (2012) confirmed the positive relationship between business and organizational performance (Ebarefimia et al., 2012). However, several studies have illustrated a weak relationship. In a study, Abdollahbeiga et al (2020) described the relationship between communication and organizational performance as insignificant (Abdollahbeig & Salehi, 2020). Nevertheless, Farmansyah et al (2020) reported the severity of the relationship between communication and organizational performance as small and insignificant (Farmansyah & Isnalita, 2020).

Several variables were considered to find moderators and the three variables of "country", "year of publication", and "Research subject" were identified as moderator variables. The statistical population considered in the articles included companies, academic and educational centers, hospitals, commercial centers, service centers, and small and medium-scale companies. While the intensity of this relationship was higher than the average in commercial centers, service centers and healthcare centers, its intensity was lower than the average in educational, marketing and governmental organizations. The increase in correlation in business and service sectors can be triggered by the atmosphere of communication in these centers. The relationship between communication and organizational performance in China, Malaysia and Iran was significantly different from other countries. The results obtained from the subgroup analysis for other countries cannot be emphasized due to the number of data (less than 3 data) in each group. The total correlation changes from 2012 to 2021 are presented in Figure (3). The general trend of the graph illustrated an increase in reported correlations during this period. The sharp increase in this relationship, especially after 2017, revealed the critical role of communication in improving organizational performance.

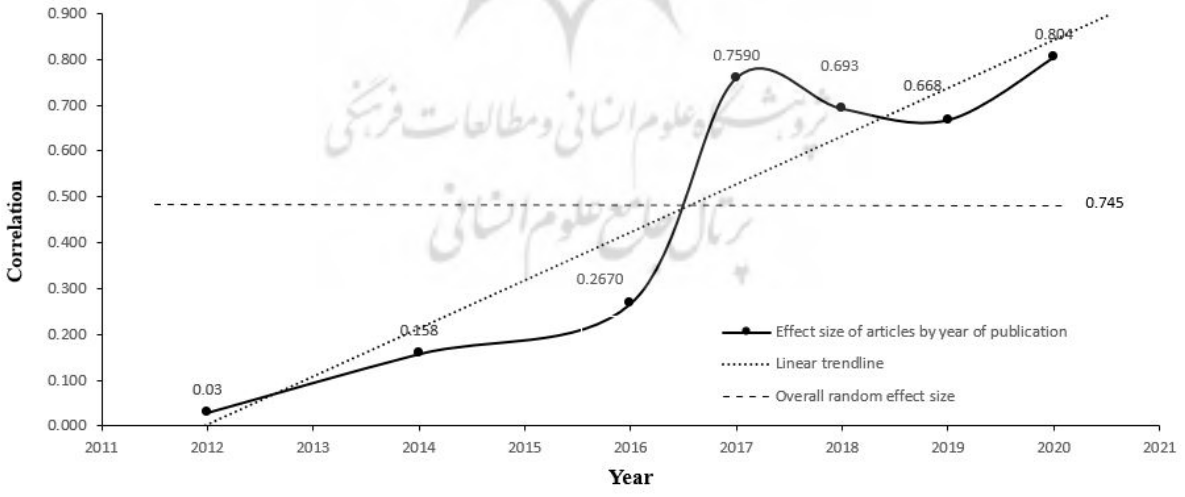

Figure 3. *Changes in total correlation resulting from meta-analysis over the years*

Academic application

Contradiction in the results of previous research studies make it difficult for the researchers to conclude. Based on a pre-defined standard, developing theories, conceptual frameworks and models could be helpful for future research programs. Identifying the year of publication as a moderator of the relationship between communication and organizational

performance and observing the increasing trend of the intensity of this relationship in recent years can create a new perspective for researchers to conduct further research to find the main causes of this phenomenon. Furthermore, the identification of “country” variable as a moderating variable opens a new horizon for researchers from different countries to localize the results of international research to their desired region. Identifying the variable "Research subject" as a moderator of the relationship between communication and organizational performance not only in addition to the possibility of comparing the effect of communication on performance in different subjects, it provides the possibility of creating a model of an effective communication system for a purpose in which communication is ineffective.

Practical application

The results of meta-analysis studies are reliable tool for making decisions in practical matters due to the presentation of comprehensive statistical results. In addition, by identifying the Research subject, we found that in educational and marketing systems, the role of communication is weak, where managers and policymakers can improve the organizational performance by investing and strengthening communication in this field. Furthermore, communication in trade and service companies plays an effective and meaningful role that managers and policymakers can rely on as a model to strengthen communication in organizations and improve their organizational performance. However, in the countries of Iran, Malaysia, Ghana, Palestine, and Indonesia, the role of communication has been weak. Accordingly, these managers and policymakers active in these areas should pay more attention to improve their communication-driven organizational performance. The increasing trend of the influence of communication on organizational performance, especially after 2016, demonstrates the increasing importance of communication in improving organizational performance.

Limitations

The stability of the present study results was confirmed by using Rosenthal's fail-safe N test. Despite all efforts, some limitations affect the results of this study. Therefore, even with the publication bias in this study, the results still have favorable stability. The lack of access to unpublished articles and some published articles, the time range for the selection of articles from 2012 to 2021, and the influence of publication bias on the results are the tangible instances of these limitations. In future, more accurate results can be achieved by choosing a larger time frame, selecting the articles published in other languages or other databases, and obtaining new moderator variables. Various biases including language, selection, citation, and publication were considered in this article. To avoid these biases, a specific protocol was used for the selection of articles.

Conclusion

In recent years, the discussion on the importance and impact of communication on organizational performance has gained increasing importance, owing to its influence on organizations and sustainable development. This study aimed to investigate the significance and severity of communication's impact on organizational performance. Additionally, it explored the moderating effects of research topic, country, and year of publication.

The main contributions of this article to the existing body of knowledge can be summarized by examining the research subject, country, and year of publication as follows:

1. This study elucidates these aspects by identifying the research topic as a moderator and focusing on developing strategies to enhance the role of communication in organizations. The findings can guide policymakers in adopting effective approaches to improve organizational performance, particularly in

hospitals, educational centers, and marketing systems.

2. Furthermore, an executive review of different countries can shed light on the role of communication in advancing organizational goals. The constructive role of communication in Iran, Malaysia, Palestine, and Slovenia is comparatively weaker than that of China, America, Indonesia, and South Korea. This finding suggests that managers and senior leaders in these countries should employ better strategies to improve the situation. However, further research is necessary to reach a definitive conclusion about the effects of communication on organizational performance in Iran, Malaysia, Palestine, and Slovenia.
3. Additionally, considering the "year of publication" as a moderator indicates an increasing intensity of the relationship between these two variables in recent years. The moderating role of publication year increased significantly from an intensity of 0.03 in 2012 to 0.804 in 2020, highlighting the growing importance of this issue in recent years. Moreover, researchers can consider incorporating other moderators to gain a more comprehensive understanding of the relationships influencing organizational performance in recent years.

Practical and theoretical implications: Communication, as an inseparable and influential part of organizations, plays a central and constructive role. Therefore, exploring new methods to enhance communication's performance can significantly strengthen overall organizational performance. This study provides valuable insights into the role of communication and the moderating factors influencing organizational performance, taking into account ethical considerations and empowerment perspectives. By delving deeper into these aspects, a comprehensive understanding of the dynamics affecting performance can be achieved.

The present study has made significant theoretical progress by employing meta-analysis, which systematically combines or integrates the results of single cases and independent studies, using statistical methods to calculate the intensity of communication's impact on organizational performance. The authors have successfully developed a theoretical model and applied a quantitative approach using meta-analysis in the field of communication research.

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