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استخدام الامتحان التقليدي في اللغة الإنجليزية كأداة تقييم لمادة القراء

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ملخص:

تفحص هذه الورقة البحثية صلاحية امتحان Rational Cloze و امتحان Traditional Cloze كأدوات تقييم لمادة القراءة المقررة على طلبة قسم اللغة الإنجليزية بجامعة الجبل الغربي . تفترض هذه الدراسة أن الامتحان الأول مناسب أكثر لتقييم مادة القراءة من الامتحان الثاني.

أشترك في هذه الدراسة عدد 55 طالب مسجلين بالسنة الأولى حيث أجاب الجميع عن أسئلة من النوع الأول وأخرى من النوع الثاني لاختبار قدرتهم على القراءة باللغة الإنجليزية. و عند مقارنة نتائج الامتحانين تبين أن الامتحان الأول ليس أكثر سهولة من الامتحان الثاني وأن نتائجه ليست الأفضل حيث وجد الممتحنون الامتحان الثاني أكثر سهولة من الامتحان الأول و كانت النتائج أفضل من الامتحان الأول.

استنتجت الدراسة أن الامتحان الثاني يعتبر أفضل من الامتحان الأول لتقييم مادة القراءة لطلاب الجامعات الليبية الدارسين لمادة اللغة الإنجليزية كلغة أجنبية و هو ما نوصي به أساتذة مادة القراءة باللغة الإنجليزية.

USING TRADIONAL CLOZE TEST AND RATIONAL CLOZE TEST FOR READING COMPREHENSION ASSESSMENT

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Abstract

This study examines the validity of the Traditional Cloze Test and Rational Cloze Test as assessment tools to reading comprehension courses. It is assumed that rational cloze test (RCT) is better assessment instrument to reading comprehension than traditional cloze test (TCT). The reading comprehension of 55 first year university students was tested by using both of testing instruments (i.e. RCT&TCT). The t-test results revealed that there was no significance between the results of the traditional cloze test and the rational cloze test. It was clear that when the reading comprehension of study participants was assessed by the traditional cloze test, the results were much better than when they assessed by the rational cloze test. This significant result was discussed in relation with the literature reviewed in the paper. Pedagogical implications may need to be considered regarding reading comprehension assessment.

Key words: reading comprehension, rational cloze test, traditional cloze test, assessment, t-test.

Introduction

We send our children to school to learn how to read and write. Reading and writing skills are of a considerable importance in the modern world. Though not everybody has to be a perfect writer, reading is a skill everybody has to master to progress in our modern life style. This means that

fluent reading is the ultimate goal of any successful reading comprehension course.

Fluent reading has many benefits. Academic success cannot be achieved if individuals have poor reading performance. It helps in improving writing skills, listening skills, and improving spelling accuracy, (Leung, 2002; Mason and Krashen, 1997). Learning a foreign language can also be enhanced by reading since "a great deal of language learning- lexis, syntax, rhetorical organization- would be accomplished via reading" (Urquhart and Weir 1998, p.24). Thus, reading is a unique skill; teachers, researchers, and curriculum designers are recommended to work hard to guarantee that students' reading performance in all education levels can develop fully. Based on that reading comprehension courses in the university level has to be carefully constructed to achieve fluent readers.

Among many factors which affecting the progress in reading skill such as the selection of text books and the teaching methods used, assessment is an important factor which should be carefully considered by teachers to guarantee the desirable production, i.e. fluent reader. Testing reading comprehension can be achieved by using many types of tests. Tests such as open-ended, multiple-choice, traditional cloze test and rational cloze tests are widely used by school teachers and language researchers.

This study examines the validity of the traditional cloze test and rational cloze tests as assessment tools to reading comprehension courses. It is assumed that rational cloze test (RCT) is better assessment instrument to reading comprehension than traditional cloze test (TCT). The reading comprehension of 55 first year university students will be tested by using both of testing instruments (i.e. RCT&TCT). The results will be compared by using T-test which will show which test type is more valid than the other. Finally the findings will be discussed in relation to the literature reviewed.

Background

There are many test types which can be used to assess reading comprehension. Tests such as open-ended, Yes/No questions, multiple-choice, traditional cloze test and rational cloze test are widely used by school

teachers and language researchers. In this background the major test instruments will be reviewed with the focus on their limitations.

Open-ended questions

In this test type, examinees are given a written text followed by questions based on the content of the text . The respondents answer the questions by using their own words, and they have the chance to express their own opinions and background knowledge, which may differ from one respondent to another, when answering these questions. The respondents' qualitative production may face the following challenges:

1. Many students find this question type difficult to answer. On the one hand, the examinee needs to read the whole text more than once to get the answer. That could waste valuable limited time. On the other hand, students need to write the answer in full which is difficult for students with poor writing skill.

2. The wording of many open-ended questions could lead the examinee to find the answer regardless of his/her understanding of the text's meaning, and could offer the examinee useful information about the content.

3. The answers to the open-ended questions are difficult to correct and it is difficult for the corrector to be objective, which may affect the validity of the test.

Multiple-choice questions

As stated in the Wikipedia, followed by a text given, the tested participants of this question type are given a list of four or five options and they are asked to select the best possible answer (or answers) out of the choices from the list. Among the common limitations of this test type are as follows:

1. Students can easily cheat even if strict precautions are taken. Signaling the fingers is a common way of cheating among students.

2. It is a time consuming process since the examinee needs to read the whole text more than once in order to answer a few questions. In many cases time runs out before students manage to finish the assigned test.

3. It is difficult to prepare. If a test is piloted and it is found that some questions should be deleted, the whole text is ruined and rewriting it is the only way out.

4. Bensoussan and Ramraz (1984, p.231) highlight the theoretical issues regarding whether this test type is a valid method of testing reading comprehension. They claim that "it is not clear whether multiple choice scores reflect test comprehension, ability to choose the correct distracter, or both."

5. Another defect of the multiple choice test is that examinees could choose correct answers merely by chance. Students can tick one of the options related to a question in the hope that his/her random choice could be correct.

6. A final limitation was mentioned by Wolf (1993, p.474). He argues that "sometimes test items can be answered without reading the passage; that is, they are not passage dependent". An examinee could use his/her background knowledge of the world to recognise the correct answer. Such a claim, however, could only be justified if the test is poorly constructed. In summary, "it is for such reasons (and others) that the validity of traditional comprehension or multiple-choice test has been seriously questioned in recent years" (Davies 1995, p.28).

Traditional cloze test

This assessment instrument was first suggested by Taylor (1953) and the word cloze was derived from ***closure.*** This test is based on the ability to comprehend a text in which the reader has to supply the missing words that have been removed from the text at regular intervals. It requires the ability to understand context and vocabulary in order to identify the correct words or type of words that belong in the deleted passages of a text. When preparing the text of the cloze test every N^{th} word is deleted from the text which is commonly the 6^{th} word, and to make the test easier a higher N value is deleted. The task of the participants is to read the modified text carefully and fill in the spaces with their best guesses of the deleted words. When correcting the answers synonyms and misspelling are tolerated since comprehension of the text is the aim of the test.

Traditional cloze test limitations

1. Unlike open-ended and multiple choice questions where examinees read a given text followed by questions, the cloze test serves as the reading passage. This means that the examinee has a text which has a global meaning but with systematic gaps embedded throughout, which requires the examinee to supply suitable words from his/her mind. This is indeed a difficult task, especially for foreign language readers.

2. Some have argued that this test type is a test of linguistic skills. Much of the information needed to fill the gaps is grammatical or lexical items with no direct relation to reading comprehension. Wolf (1993, p.475) argues that items needed for the cloze test gaps "are often based on cues from the immediate environment around the blank rather than information from the whole text."

Rational cloze test

This test type is a developed version of the traditional cloze test where only certain language category such as prepositions are deleted from the text. To make this test easier, the examinees of this study are given three options and they are asked to choose the correct one. This assessment instrument has been used by many EFL teachers and educational researchers because of its consistency and practicability. For example, Goldman and Murray (1992) used this test procedure to test the reading comprehension of their participants. Many other researchers have examined the validity of this test type and found it consistent. McKenna and Kent (1990; cited in Goldman and Murray, 1992), stressed the sensitivity of the rational cloze test to the inter-sentential integration. In line with this, Bensoussan and Ramraz (1984) compared the multiple-choice test with the rational cloze test (they label it as fill-in test). Their testing reading comprehension findings emphasized the validity of the rational cloze test as an important instrument for testing reading comprehension. They reported that, "the fill-in tests reading comprehension not only test words and word forms at the micro level, but, more importantly, the ability to follow a logical thought sequence at the macro-level of reading" (Bensoussan and Ramraz 1984, p. 237).

Many advantages of this test type have been reported in the literature on testing reading comprehension. Among them are the following:

1. Its suitability as a valid test when the words and phrases in the gaps are function words such as conjunctions or prepositions. Bensoussan and Ramraz (1984, p.232) recommended that,

> Function words, such as "however" and "therefore", would be good places for blanks. Other items tested could be cohesive markers such as "not only…but also", "either…or", and "on the one hand …on the other hand.

2. The second advantage of this test is its simplicity and flexibility to suit the specific needs of the designer.

3. It can be corrected easily and objectively.

In this part of the study the major reading comprehension tests used by English teachers and educational researchers were reviewed. Definitions and limitations of these test types were highlighted with the focus on the rational cloze test, which together with traditional cloze test, will be compared and evaluated in this study. Next, the research methodology of the study will be presented. This will cover data collection and analysis, discussion, conclusion and recommendation of the study.

Research methodology

This paper tried to examine the validity of two reading comprehension tests- the traditional cloze test and the rational cloze test and whether one of them is more valid to test RC than the other. It is assumed that the rational cloze test is more valid instrument to test reading comprehension than the traditional cloze test. Fifty five first year university student studying English as a foreign language's reading comprehension were tested by using both the mentioned above testing instruments. The results of both tests were compared by using t-test to see which one of them is more significant than the other. Next, the results are discussed in relation to the literature reviewed. Finally, conclusion and recommendations for English language teachers and educational researchers will be highlighted.

Research questions

Data collected by the researcher tried to answer the following questions:

1. Can Libyan university students studying EFL get better results if their reading comprehension is assessed by using the traditional cloze test?
2. Can Libyan university students studying EFL get better results if their reading comprehension is assessed by using the rational cloze test?
3. Which is better testing instrument for assessing the reading comprehension of Libyan university students studying EFL, the TCT or the RCT ?

Participants

55 first year university students studying English as a foreign language participated in the study. Their ages vary from 20 to 23 years old as figure 1 below shows. 87.3 per cent of the participants were males and 12.7 per cent were female students. All of them joined the English Department after they had finished the public secondary school, which suggested that their English language level is approximately similar. The Libyan standard educational state system obliges that all secondary school students to follow the same curricula, taught by teachers with the same qualifications, and spend the same time in schools. English as one of the obligatory subjects assigned to preparatory and secondary schools is not excluded from this system. The English department, where the study took place, used to have a qualified test for the students who want to join the department and admit only students who get at least pre-intermediate level; however, this year (i.e. 2013-2014 academic year), and due to external factors, all the students who applied to join the department were admitted! In general, it can said that the majority of the study sample who joined the department had strong desire to learn English and had the basic information of the four English language skills.

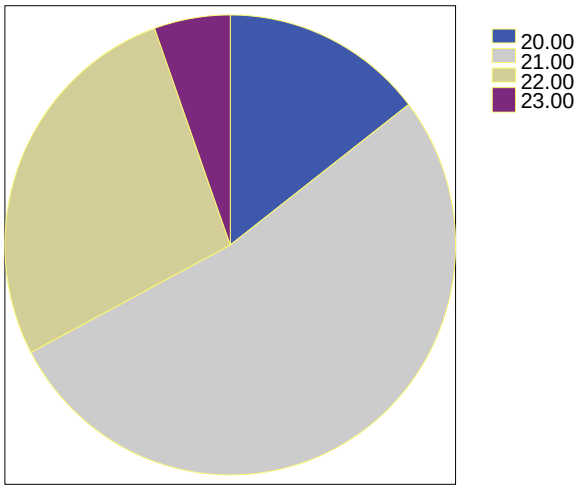


Figure 1. Frequency of participants' ages

	frequency	percentage
Male	7	12.7
Female	48	87.3
total	55	100

Table 1. Percentage of participants' gender

Instruments

The texts selected for testing the reading comprehension of the study participants were adopted from Mosback and Mosback (1976). Both of them were expository texts prepared along with many others to be a part of reading comprehension syllabus for foreign students learning English as a foreign language. As stated in Innajih (2007), the reason behind choosing expository texts was the belief held by many language researchers, such as Goldman and Murray (1992, p.504), that "the less a reader knows in the domain, the more important is knowledge of how general linguistic devices may be used to ascertain the local and global structure of the text." In agreement with this, Sanders and Noordman (2000, p.39) recommend that,

> We explicitly focus on expository text here because we believe that the bias for (simple) narratives threatens to be a problem [because] simple narratives and stories have a very peculiar

structure, which is not very complex and quite stereotypical…, whereas expository text usually describes new information that the reader does not know about.

Thus, it is assumed that foreign language readers of expository text need to use the context structural and grammatical clues to understand the text message because of their lack of external information related to the topic.

The text selected to be used as the rational cloze test (i.e. canning food) has about 336 words. It was modified to accommodate an equal number from each conjunctive type- additive, adversative, causal and temporal as Halliday and Hasan (1976) classify them . Some of the conjunctives existed in the original text and few others were added to balance the number of conjunctions from each type. The passage was designed to take the form of a rational cloze test. The cloze slots were supplied with three conjunctives from different types in the form of multiple-choice alternatives. Choice of conjunctive was directed by the semantic relation existing between the preceding and the following independent sentences or sometimes paragraph when the relation is global.

The text selected to be used as the traditional cloze test (i.e. why the moon changes) has about 301 words. It was one of about fifteen other texts chosen and revised carefully to be used as reading course materials for university adult non-native speakers of English. The authors, Mosback and Mosback (1976, p.vii), emphasise that "the vocabulary level basically corresponds to level 5 of the *Cambridge English Lexicon*, and is entirely within the 5,000 words of the *ladder* vocabulary, developed initially by the United States Information Service."

Every 5^{th} word of the text was deleted and replaced by three options in the form of multiple choice questions. This is done to be in accordance with the rational cloze test form and to make the test easier for the participants to answer. The options were selected from different language category such as noun in different types, verb in different tenses, adverb, conjunctive, preposition…etc. The participants were asked to guess the best option that replaces the deleted word and completes the meaning of the text.

Procedure

At about ten o'clock in the morning and in a quite large room both tests (i.e. traditional cloze test and rational cloze test) were given to the study participants for answering. Brief explanation of how to answer the tests was given. They were assured that the results of the tests will only be used for research and the marks they will get will not be used for their academic assessment. This is to encourage them to answer the questions without stress and to avoid cheating.

Enough time was given to complete the tests and questions raised by the participants were answered in brief. This is to be sure that all questions are answered and no missing data will disturb our quantitative analysis. After about an hour all papers were collected to be ready for correction and analysis.

Data analysis

The collected papers were corrected out of a hundred. By using the SPSS computer software programe the means of both tests were calculated. The minimum mark of the traditional cloze test result was 32.60 and the maximum mark was 81.40. The mean was found to be 55.94. The minimum mark of the rational cloze test result was 00 out of a hundred and the maximum mark was 70. The mean was found to be 36.90.

Table 2. Mean and standard deviation of TCT & RCT

Test type	No. of participants.	Minimum	maximum	Mean	St. deviation
*TCT	55	32.60	81.40	55.94	12.45
*RCT	55	00	70	36.90	13.86

T-test analysis

Statistical t-test was conducted to find out if there was any significant difference between the mean scores of the traditional cloze test and the rational cloze test attended by one group of 55 first year university students studying English as a foreign language. As stated by Kranzer and Moursund,

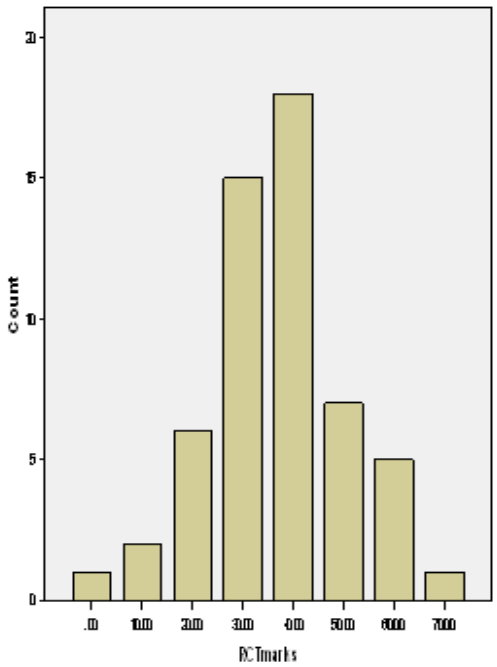
1999, p.89) in Innajih (2007), the purpose of using a t-test analysis is "to determine whether the means of two groups of scores differ to a statistically significant degree." Based on this, and because the comparison was between two tests of the same group, a paired-samples t-test was conducted to compare the mean scores of the two reading comprehension tests. The level of significance was chosen to be 0.05, which is widely used value in social science.

The t-test result revealed that there was significant difference in scores between the traditional cloze test results (M = 55.94, SD =12.45) and the rational cloze test results (M =36.90, SD =13.86); t (54) = 0.000.

Table 3. Mean comparison

	Test Value = 0					
	t	df	*Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
*TCT. marks	33.320	54	.000	55.94000	52.5741	59.3059
*RCT. marks	19.748	54	.000	36.90909	33.1620	40.6562

*TCT: Traditional Cloze Test, *RCT: Rational Cloze Test, *Sig: significance



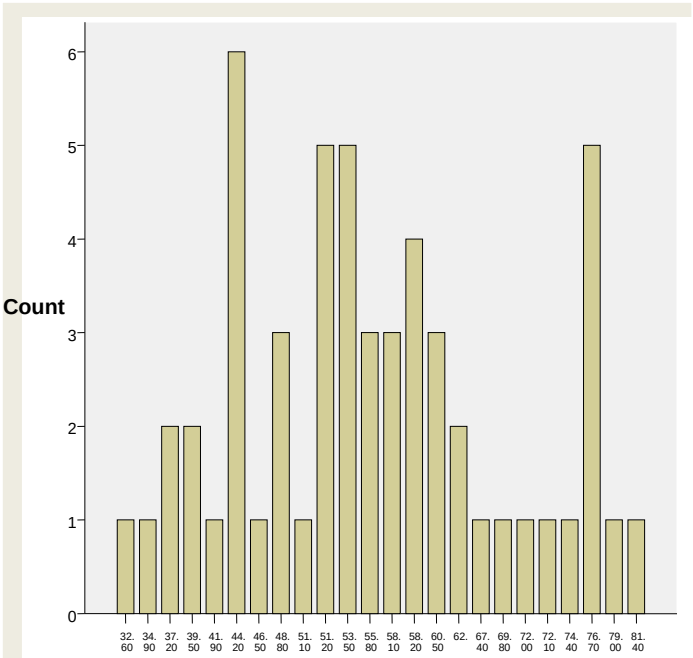


Figure 3. Traditional cloze test marks

Figure 4. Rational cloze test marks

It was clear that when the reading comprehension of study participants was assessed by the Traditional cloze test, the results were much better than when they assessed by the Rational cloze test. This significant result will be discussed in relation with the literature reviewed above.

Discussion

The findings of the data analysed above revealed that the participants found the traditional cloze test easier than the rational cloze test to answer. In other words, the study participants performed better with the traditional cloze test. This could be attributed to the following reasons:

1. The ration cloze test (RCT) was prepared with the assumption that the participants have enough knowledge about conjunctions (i.e. their form, meaning and function), which appeared to be incorrect. A close investigation of the test papers revealed that the participants were indiscriminate in their selection. Most of their choices were not based on any grammatical or semantic basis.

2. The language items used in the RCT (i.e. conjunctions) could be something new to many of the participants, or difficult to understand especially the adversative ones. It seems that in their secondary school, they were exposed to such items under other titles such as coordinators or subordinators or just connectors. With the large number of conjunctives as suggested by Halliday and Hasan (1976) in mind, the results of the tests suggested that the participants were exposed only to simple connectives such as *and, but, yet, then...* etc.

3. The normal form of the TCT is based on the deletion of every *Nth* word; however, and to have a similar design to the rational cloze test, the test version which was given to the study participants was modified to include three options to choose among them instead of a space. And most of the options given can be easily guessed by using grammar or context. The options given were related to all language categories such as nouns, verbs, adjectives, adverbs, prepositions…etc. This means that the participants had many clues to use for guessing. On the other hand, with the RCT, knowledge of grammar did not help much since most of the conjunctive items are related to the same grammatical category (i.e. adverbs). Furthermore, the meanings of some of the conjunctions are very close since with their large number, they are related to only four semantic categories as Halliday and Hasan (1976) classify them, (i.e. additive, adversative, temporal, and causal. For instance, the conjunctives *although* and *eventhough* are related to the same category, (i.e. adversative).

4. Limiting the options of the rational cloze test to only one language category (i.e. conjunctions) narrows the scope of guessing for the examinees. This means that if the examinee has no idea about conjunctions s/he will fail to get any scores for all the options given since all of them are conjunctions. This actually what had happened to many study participants. Whereas the traditional cloze test has many options which are related to a variety of language categories. This means that s/he has many clues such as context clues and grammatical clues to use for guessing. The study participants managed to use meaning, tense, gender, background knowledge…etc. to guess the correct option.
5. Many studies found that some conjunctive types are more difficult than others. For example, the findings of Stoodt's (1972) study revealed that some conjunctions are significantly more difficult and a

few others were significantly easier. Conjunctions such as *so, but, or, while* were found to be difficult, whereas conjunctions such as *and, how* and *for* were found easy for readers to use in reading comprehension. This means that the study participants might find some of the conjunctives given in the rational cloze test difficult to understand and use which affected their performance in the test.

Finally, It was clear that the modification version of the traditional cloze test was easier to answer than the traditional cloze test because of the options given. It is believed that if the normal version, which is based on the deletion of every N_{th} word, was given to the study participants, they might find it more difficult than the rational cloze test since the scope of guessing would very wide and the search for the correct missing word would be difficult.

Conclusion and recommendation

It was evident that the reading comprehension of the study participants was better assessed by using the traditional cloze test since their results were significantly better with it. The rational cloze test was found to be difficult for the participants in comparison with the TCT for the reasons highlighted above. In conclusion, it can be said that two major reasons might lead to this result: the little knowledge the participants had about conjunctions and the modification of the traditional cloze test which restricted the participants' guessing scope.

To rely on such results and be able to generalize these findings it has to be sure that study participants have enough exposure to conjunctions as cohesive items and their role in reading comprehension before the rational cloze test can be used to assess the reading comprehension of students studying EFL.

A large number of studies emphasized the benefit of conjunctions to reading comprehension since they direct the reader to the intended meaning by narrowing the scope of guessing and save the time of readers. However, to benefit from these text ties both in normal reading and in using them in such assessment tools such as rational cloze test, it is vital that the students can

identify the form of conjunctions, understand their meaning and have enough experience about the functions of these language items.

To conclude it can be said that more research works about the validity of the rational cloze test are needed to be done to have trusted findings which the reading comprehension course teachers can use with confidence. Explicit teaching of conjunctions is vital to get the benefit of these cohesive items. Many assumptions which most of the university lecturers have about their students' English language ability appeared to be incorrect. Students' ignorance of conjunctions is just one example.

It is recommended that curriculum designers include conjunctions in the university syllabus with enough drills not just as grammatical items but as cohesive ties help in understanding any written text if they are used correctly. University lecturers also need to explicitly teach these items (i.e. their form, meaning and function) to benefit from them in their students' reading and writing skills..

About the author

Dr. Abdussalam Ammar Annajeh is an assistant professor of English at the Faculty of Arts-Gharian, Al-jabal Al-gharbi University. I had my M.A. in teaching EFL from Tripoli University in 2002 and PhD. from Newcastle University in 2007. I published many research papers in local and international magazines about reading comprehension, cohesion and cohesive ties (i.e. reference, conjunctions, lexical cohesion...etc.)

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نظام الحامل الواحد مع التقوية في نطاق التردد المدموج مع تقنية تعددية المستخدمين IFDMA

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ملخص

ويعتبر تحميل متعدد الحوامل يتم معالجته في هذا المقال على أساس انه نظام متعدد الوصول المتعامد ومن تم يطبق على نظام الحامل الواحد (SC/FDE) ذو التقوية في نطاق التردد. نظام SC/FDE النطاق الواسع فعال في القنوات الموسومة بالتردد المتجزئ. ضم SC/FDE مع تقنية الإرسال متعدد المستخدمينIFDMA يعالج التداخل الناتج عن تعدد المستخدمين وكذلك يعالج قناة التردد المتجزئ في نفس الوقت. نظام SC/FDE يفترض إرسال البيانات (الحزم) وبالتالي طبيعيا يتناسب مع IFDMA الذي أيضا يتطلب إرسال البيانات على شكل حزم. النظامين يستفيدان من إتمام عملية التقوية في نطاق التردد كبدبدل من إتمام عملية التقوية في نطاق الزمن .

Single Carrier with Frequency Domain Equalization SC/FDE System Combined with Multiple Access IFDMA

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ABSTRACT

The Interleaved frequency division multiple access (IFDMA), a multicarrier modulation is treated in this paper as an orthogonal multiple access technique and hence applied to the single carrier with frequency domain equalization (SC/FDE). SC/FDE a broadband system is effective and robust in frequency selective fading channels. By combining SC/FDE and multiusers transmission technique IFDMA, the frequency selective channels and multiuser interference are simultaneously treated. SC/FDE proposes block transmission and naturally suits the IFDMA that also implies the block transmission. The combined techniques can applythe equalization in frequency domain which advantageously replaces the time domain equalization.

Keywords : OFDM, SC/FDE, CDMA, IFDMA

Introduction

SC/FDE has been an emerging technique in the last years, its performance is proved to be similar to orthogonal frequency division multiplexing (OFDM) [1][2]. SC/FDE has been adapted by IEEE 802.11 and HIPERLAN/2. The importance of SC/FDE stems from the relative simplicity of instrumentation

which is acquired by the relevance of constant-envelope modulation schemes and by an inherent low complexity of the equalization in the frequency domain, which advantageously replaces the time domain equalization. The fundamental difference between SC/FDE and OFDM is the place of the inverse discrete Fourier transformation (IDFT). IDFT takes place at the transmitter in OFDM,while it is shifted to the receiver side in SC/FDE. For this reason, SC/FDE is favored in up-link for the fact of the power consumption reduction by the mobile terminals. On the other hand, SC/FDE allows applying the constant envelope type of modulation [3]. This topic is of great interest when cheap power amplifiers are concerned. In contrast, OFDM performance degrades because ofits high signal fluctuation and a particular measure is necessary to reduce the impact of the power amplifiers' non-linearity, however

such measure is on the cost of the overall system performance and any power consumption savings will increase the system potential. Furthermore, the SC/FDE approach was shown to have two main advantages over OFDM, namely, lower peak to average power ratio (PAPR) and reduced sensitivity to carrier frequency errors. The rest of the paper is structured as follows: In the following section we present a general description of the SC/FDEconcept. In the subsequent section wegive an overview of IFDMA. Section IV deals with combined IFDMA-SC/FDE.Finally, simulation results demonstrate the performance of the system in termsof bit error rate (BER).

2 SC/FDE SYSTEM

SC/FDE was shown in [1] to be an attractive technique for broadband wireless channels. SC/FDE has lower complexity, due to its use of the computationallyefficient fast Fourier transform (FFT), than time domain equalization. The nature of the single carrier technique reveals a block transmission of size of*N* symbols. Imposing a guard interval to the transmitted blocks whether a cyclic prefix or unique word aims twofold: To prevent interblock interference (IBI) caused by the multipath propagation, and to make the linear convolution of one cyclic extended transmitted block and the channel impulse response to appear as a circular convolution. The frequency domain equalization principle isillustrated in Figure 1, the received signal is oversampled at twice the data rate to enable optimal digital matched filtering. A 2*N*-point FFT transforms the 2*N* samples of the received data block into the frequency domain. The output signal of the matched filter is down-sampled and *N* complex multiplications are needed for the equalization. A transmitted block consists of the original sequence of *N* symbols with duration $T_{FFT} = NT$ and the cyclic extension with duration T_G, where *T* is data symbol duration. If $s(t)$ with $t \in [0; T_{FFT}]$ denotes the original symbol sequence of one block then the extended block is given by

$$s(t) = \begin{cases} s(t) & t \in [0, T_{FFT}] \\ s(t + T_{FFT}) & t \in [-T_G, 0] \\ 0 & otherwise \end{cases} \quad (1)$$

the baseband signal of one block of length *N* is expressed as

$$s(t) = \sqrt{2E/T} \sum_{n=0}^{N-1} d_n \; g(t - nT), \quad (2)$$

where d_n, *E* and $g(t)$ are the data symbols, the symbol energy and the pulse shape respectively.

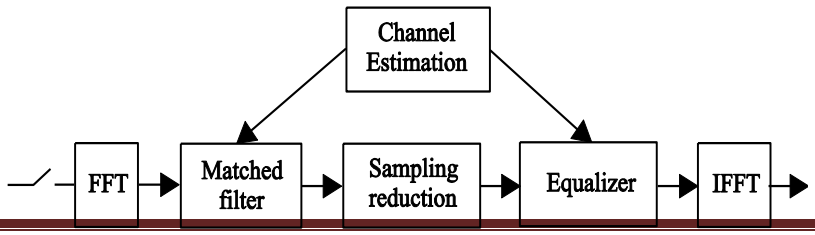

Figure 1: Low complexity implementation of an optimal frequency domain equalizer.

3 Interleaved Frequency Division Multiple Access IFDMA

The IFDMA is a modified version of the frequency division multiple accessbased on spread spectrum techniques that was first proposed by Soreger [4].The aim is to alleviate the multiple access interference MAI. IFDMA is suitablefor down- and uplink applications and combines the advantages of a multicarrierCDMA and FDMA [5, 6]. Instead of spreading the data symbol as in CDMA,the data symbol in IFDMA is shrunk and compressed in the time domain. Theprocess turns out to be a spreading in the frequency domain. For this reason,the scheme falls under the spread spectrum (SS) technology. The data symbolcoloured red (solid) in Figure 2 is spread to obtain a CDMA symbol coloured blew (dotted). Incontrast, the data symbol coloured blew (dotted) in Figure 3, is compressed to obtainan IFDM symbol that is shown in red (solid). This shows the principle's similaritybetween CDMA and IFDMA.

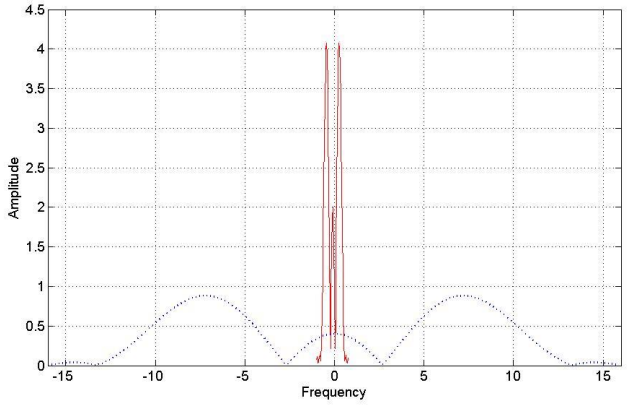

Figure. 2: A s ta symbol red (solid)

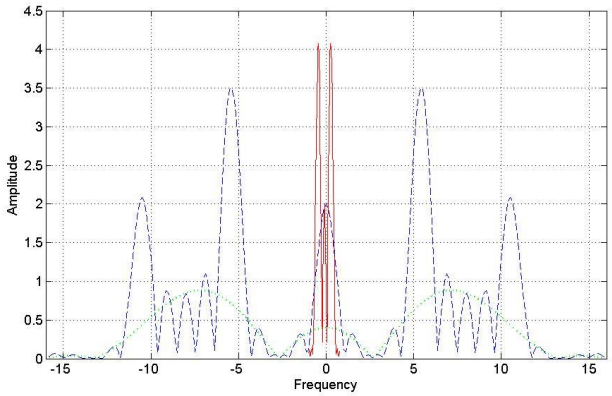

Figure 3: A single user IFDMA symbol (solid red) is obtained by compressing thedata symbol (dotted green).

In IFDMA, the users' discrimination is achieved by the orthogonality feature.The compression and the periodic repetition of the data symbols causean equally spaced distribution of subcarriers in frequency domain, with zeropoints in between where other users carrier can be positioned [7]. The user'sdiscrimination is established by shifting each user in frequency domain. Thisis implemented through the rotation of the phase of each user's signal, thatresults in the interleaving of the users. The number of users is determined bythe number of repetitions as shown in Figure 4. IFDMA has been evaluatedand considered as a power efficient candidate for next generation of mobile radiosystems. Furthermore, the IFDMA is a scheme that is equivalent, on the onehand, to DFT pre-coded interleaved OFDMA, which is also denoted as OFDMFDMA[8]. Basically, the pre-coded interleaved OFDMA is a multiple accesstechnique that assigns more than one subcarrier to the same user in order torobustify the performance against channel fades [9]. On the other hand, IFDMAis equivalent to a block transmission CDMA with frequency domain orthogonalsignature sequences (FDOSS) and chip interleaving [8][10].

Besides IFDMA, there are new evolved multiple access schemes for robustsignaling considered and investigated in 3GPP LTE [11] and WINNER [12] aspromising candidates for the uplink. These are block interleaved IFDMA (BIFDMA)and localized FDMA (L-FDMA), that share the low envelope signalfluctuation property. IFDMA can be interpreted both as a serial modulation(FDOSS) and a multicarrier modulation scheme, thus combining many of theadvantages of the two approaches. As a special case of frequency domain basedserial modulation (using interleaved assignment of subcarriers), it enables thesame high frequency

diversity and low peak to average power ratio. It also facilitateslow complexity signal generation and user separation (as for OFDMA).

Similar to SC/FDE, IFDMA scheme imposes a block transmission of N data symbols$d_n^i$where $n = 0, \ldots, N\text{-}1$, for each user i, $i = 1, \ldots, N_u$. The symbol rateis $R_s = 1/T_s$ and T_s denotes the symbol duration. A guard interval of lengthT_g is inserted to reduce the inter-block interference and T_g has to be greaterthan the maximum delay time of the transmission channel. An IFDMA symbolis simply constructed via two processes, firstly, compressing a block of N datasymbols, such that a symbol occupies a T_s time duration is compressed to aduration of $\frac{T_s}{L+L_g}$where $L+L_g$ represent the compressing factor however, L_g isassigned to the guard interval and sometimes dropped. Secondly, repeating theresulting compressed block $L + L_g$times. Hence, an IFDMA symbol occupiesa time duration of $N(L + L_g)T_c$, where T_c is a chip duration and related tosymbol duration such that$T_c = \frac{T_s}{L+L_g}$. In a vector notation an IFDMA symbolcan be expressed as follows

$$c^{(i)} = \frac{1}{L+L_g}\left[d_0, \ldots\, d_{N-1}^{(i)}, d_0^{(i)}, \ldots\, d_{N-1}^{(i)}, \ldots\right]$$

In a compact form, it can be written as

$$c^{(i)} = \frac{1}{L+L_g} d_{l \bmod N}^{(i)}, \qquad l = 0, \ldots, L_c - 1$$

$L_c = L + L_g$, IFDM signal can be represented in a continuous time form c(t) and given by

$$c(t) = \sum_{l=0}^{L-1} d\left(L\left(t - \frac{lT}{L}\right)\right). \qquad (3)$$

The Fourier of c(t) is then

$$C(f) = \frac{T}{L}\, D\left(\frac{f}{L}\right) \sum_{l=0}^{L-1} e^{-i2\pi f l\left(\frac{T}{L}\right)} \qquad (4)$$

it is the spectrum of an IFDMA signal and represents the spectrum of the datashifted to each other.

4 IFDMA-SC/FDE SYSTEM

A block diagram of an IFDMA-SC/FDE system is shown in Figure 5. Rootraised cosine filter with roll of α= 0:25 is used for pulse-shaping for linearmodulation BPSK. A block of N size data that is compressed by a factor of 1/$L$and repeated L times is the input to the modulator. The output is multiple usersorthogonally modulated by elementwise multiplication with a

user-dependentphase vector of dimension L_c having components$e^{-2\pi j\frac{lk}{NL}}$for the k[th] user and$l$ = 0,1,…,L_c -1, the phase vectors assure users discrimination. The receivedsignal at the receiver is equalized in frequency domain as shown in Figure 1, thena process of discrimination and detection starts and users are simultaneouslyseparated.

5 Simulation results

In the conducted simulations, the system bandwidth is 20 MHz and parameters are adapted to the IEEE 802.11a standard. The channel estimation is assumed to be ideal. The repetition factor L= 12 where 4 for the guard interval and data symbol Q = 32. Figure 6 compares the BER of the BPSK signals of IFDMA-SC/FDE for a number of users. Figure 7 depicts and compares systems performances for IFDMA-SC/FDE in multipath environments (IEEE multipath channel model) with both zero-forcing and minimum mean square error equalizers.

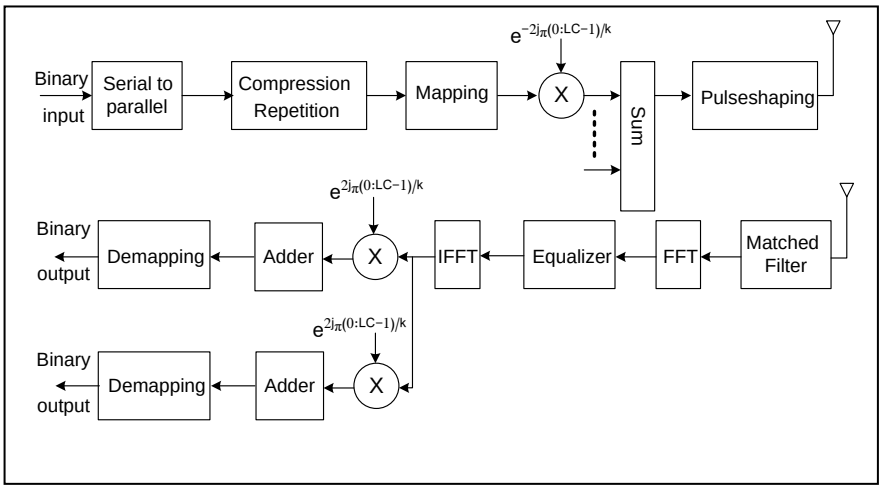

Figure 5: Block diagram of an *SC/FDE -IFDMA* with a frequency domainequalizerfor the k^{th}user, Lc = LN, L being the compressing factor and N thenumber ofsymbols per block.

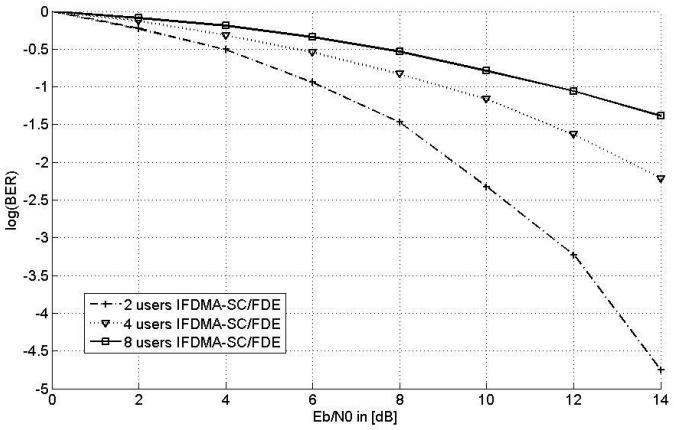

Figure 6: IFDMA-SC/FDE for different number of users scenarios in an IEEE multipath channel.

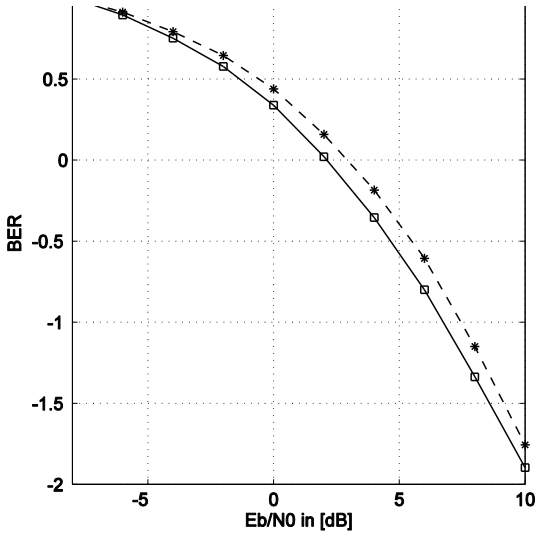

Figure 7: 8 users scenario IFDMA-SC/FDE, solid line MMSE and dashed line ZF equalizer.

6 Concluding Remarks

In this work it is shown that the localized mode IFDMA technique as a multi-users access techniquecombinedwith SC/FDE for the first time and the resulting system performance in terms of BER is reported.The performance of IFDMA-SC/FDE of linear modulation is compared for differentnumber of users scenarios.The IFDM can then outperform the multiple access CDMA in terms of eliminating multiple access interference.

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نظرة عامة عن الوضع التغذوى للأطفال اللّيبيين دون السّن الخامسة

✍ د.جمال بردم
كلية الطب البشري

الملخص:

تمت مراجعة أكثر من خمس عشرة دراسة ومسح، أجري على الأطفال الليبيين دون السّن الخامسة في العقود الأخيرة، لمعرفة الوضع التغذوى للأطفال اللّيبيين دون سن الخامسة.

وتبين من خلال مراجعة الدراسات والمسوحات أن الوضع التّغذوى للأطفال الليبيين مرضي، و أفضل من الدّول المجاورة، وذلك بسبب توفر سياسة الدّعم الغذائى من قبل الدولة الليبية في العقود الأخيرة، وتوفر مغذيات ذات طاقة عالية, ورغم ذلك مازالت بعض الأمراض الغذائية متوطنة بين الأطفال دون السن الخامسة، مثل قصر القامة وفقر الدم والنحافة...إلخ.

وفى عام 1979م أجريت دراسة مقارنة بين الأطفال الليبيين والسويسريين، تبين من خلالها أن نمو الأطفال الليبيين مقارنة بأقرانهم يعانون من تأخر فى النمو، ويعزى ذلك إلى أسباب اقتصادية واجتماعية.

وفى عام 1997م,بينت نتائج المسح العربي الليبي لصحة الأم والطفل أن الحالة التّغذوية للأطفال الليبيين مُرضية، مما أدى إلى انخفاض نسبة الإصابة بسوء التّغذية فى ليبيا عنها في بعض الدول العربية الأخرى، حيث بلغت نسبة الأطفال الذين يعانون من نقص الوزن 4.7 %، ولا تتعدى نسبة الإصابة بالنّحافة إلى 2.7%، وكانت نسبة الأطفال الذين يعانون من قصر القامة الى15%.

وفى عام م2000,أجريت دراسة أخرى بيّنت أنَّ الوضع التّغذوى للأطفال الليبيين خصوصا خلال السّنوات الثلاثة الأولى من العمر متقارب مع المجتمعات المرجعية ، رغم وجود مشاكل قصر القامة، حيث وصلت نسبة قصر القامة في الريف إلى 6,1% و2.5% في الحضر.

وفى ألخاتمه نرى أنّ الوضع التّغذوى للأطفال الليبين مرضي جداً في ظل سياسة الدَّعم الغذائي، وارتفاع معدل الرضاعة الطبيعية بين الأطفال الليبيين، مع وجود قصر القامة، وفقر الدّم والنّحافة خصوصا فى المناطق الرّيفية وبين الفئات الاقتصادية والاجتماعية ذات الدخل المنخفض.

ونوصى بمزيد من الدراسات والبحوث عن أسباب قصر القامة، وفقر الدم والنّحافة، وتعزيز ودعم الرّضاعة الطبيعية بين الأمهات، مع نشر الثقافة الغذائية بين عامة أفراد المجتمع، ومحاربة بعض أمراض سوء التغذية، كالسمنة والنقرس والأمراض القلبية ذات العلاقة بعملية الغذاء والتغذية.

The nutrition status of Libyan preschool children : An overview

By Jamal Bordom

Abstract:

Nutrition status is good indicator of well-being in children. The best global indicator of children well-being is growth.

In Libya ,the nutrition surveys and field studies to assess the nutritional status of various population groups are rather scarce and limited to made sound conclusion about current nutrition situation. However, data available from those limited studies and surveys suggest that stunting, wasting, anaemia and obesity are quite prevalent among Libyan preschool children .

In 2008,local study revealed that the nutritional status of Libyan preschool children has improved as a results of the policy of development adopted throughout the country in recent decades. The lower prevalence of wasting ,stunting and undernourishment appears to reflect improved in nutritional and sociodemographic conditions in the country.

A review of literature published from 1979 to 2012 in Libya on the nutritional status of Libyan preschool children was preformed in this study .Available data from studies, reports and surveys were reviewed and used in this work.

The objective of this study is to analysis the nutrition status of Libyan preschool children and to provide a summary of data on nutritional status of Libyan preschool children.

The nutritional status of Libyan preschool children is improved during the last decades, although the stunting, wasting and anemia are still public health problem among Libyan preschool children. Stunting is more among boys than girls and in rural areas than urban areas.

Key words:

Nutritional status , wasting, stunting, anaemia, Libyan preschool children, obesity.

The nutrition status of Libyan preschool children : An overview

By Dr. Jamal bordom

Introduction:

Nutrition status is good indicator of well-being in children. The best global indicator of children well-being is growth, because infections and unsatisfactory feeding practices, or more often a combination of the two, are major factors affecting their physical growth and mental development. poor growth is attributable to a range of factors closely linked to overall standards of living and the ability of population to meet their basic needs, such as access to food, housing and health care. [1-2].

In Libya ,the nutrition surveys and field studies to assess the nutritional status of various population groups are rather scarce and limited to made sound conclusion about current nutrition situation. However, data available from those limited studies and

surveys suggest that stunting, wasting, anaemia and obesity are quite prevalent among Libyan population [3].

In 1979,a cross sectional study was conducted in Tripoli showed that the Libyan preschool children was retard in his growth parameters particularly in the lower socio-economic groups ,which points to nutritional factors as a probable cause [4].

In 1993,WHO ,report showed that the nutritional problems related to under nutrition or over nutrition and obesity or anaemia are quite prevalent in the Libyan society due to lack in nutrition education and physical activities[4].

In 2008,local study revealed that the nutritional status of Libyan preschool children has improved as a results of the policy of development adopted throughout the country in recent decades. The lower prevalence of wasting ,stunting and undernourishment appears to reflect improved in nutritional and sociodemographic conditions in the country[5].

The objective of this study is to analysis the nutrition status of Libyan preschool children and to provide a summary of data on nutritional status of Libyan preschool children.

Methods:

A review of literature published from 1979 to 2012(more than 15 studies and surveys) in Libya on the nutritional status of Libyan preschool children was preformed in this study .Available data

from studies, reports and surveys were reviewed ,summarized and used in this work.

Results:

More than 15 studies and surveys carried out in Libya were reviewed in this study .The available data indicate that the nutritional status of Libyan preschool children in the reviewed studies, reports and surveys during the last decades were adequate and satisfy although retard in growth ,anemia , stunting and wasting were most prominent mainly in low socio-economic groups in rural areas among Libyan preschool children .

A study was conducted in Tripoli in 1978which covered 1500 preschool children, revealed that 17.7% of children were anemic.

Other study carried out in Tripoli in 1981 reported that the prevalence of anemia among preschool children increased to 40.7% and wasting was encountered in 33.1% of the examined children.

In 1997,the Arab and Libyan maternal and child survey showed that the malnutrition reduced among Libyan preschool children and the percent of under nutrition was 4.7% ,the percent of wasting was 2.7% and stunting was 15%.

Regarding the prevalence of stunting among Libyan preschool children, it was more common in Aljabel Algarbi region(20.2%), Aljabel Al-Akhdar(21%) and Sirt(18.2%).

Concern the under weight it more common in Sabha, Sirt and Aljabel Algarbi ,it's about 6.7% in all of the three regions in Libya.

In 2000,the prevalence of obesity among preschool children was 7% in urban area and 3% in rural areas and more common in girls than in boys .

The prevalence of stunting(in 2000) among Libyan preschool children was 6.1% in rural area and 2.5% in urban area. The mean birth weight among Libyan preschool children was 3.200 kg.

There were significant improvements in nutritional status of Libyan preschool children between 1979 and 2000 .

The average duration of exclusive breastfeeding was 3 months and the average age of weaning in urban area was 9 months and 10 months in rural area.

En 2003,the results of the project of cluster survey multi-indicators showed that the infant mortality rate was 25 per 1000 and the under five mortality rate was 31 per 1000 live birth.

In 2012,the infant mortality rate decrease to 13.5 per 1000 live birth, the under five mortality rate was 18 per 1000 live birth and about 95% of the new born with birth weight 2.500 kg or more.

Discussion:

The results of reviewed studies and surveys showed that the nutrition status of Libyan preschool children improved during the last decades due to socioeconomic development, increased levels of education among women, prolonged breastfeeding, provision of high quality solid foods as a supplement to breastfeeding and

availability of higher energy foods. Heavy subsidies to several basic foods commodities [6].

Although the availability of higher energy foods with heavy subsidies ,the stunting still a public health problem among Libyan preschool children since long time mainly in rural area. In 2000,it's prevalence among healthy preschool children was 2.5% in urban area and 6.1% in rural area.

A national survey was conducted in 1997, from general community indicated that stunting was relatively more common with a level as high as 15% among Libyan preschool children and among boys than girls and in rural areas than urban [7].

However, the problems of stunting (mainly in regions of Aljabel Al-Akhdar ,ALgabel Algarbi and Sirt), wasting and anaemia among Libyan preschool children rest a chronic problem since long time due to absence any strategy to control this problems from the Libyan government[7,8-10].

In 2003,the result of national cluster survey indicated that the percentage of stunting was 12.1%,wasting was 3.6% and underweight was 5.3% [11].

However, the percentage of stunting reported among Libyan preschool children in national level was lower than that in surrounding countries as it was 24.9% in Egypt in 1998,and 18.3% in Algeria in 1995[1].This variation might be suggested due to improvement in socio-economic condition in Libya during the last decades. Other factors may be associated with the decrease in prevalence of stunting and wasting among Libyan preschool

children include greater availability of high energy foods ,increase of vaccination coverage, good supplementation with others types of foods, good breast feeding and control of diarrhea diseases by oral rehydration solution [12-15].

The lower mortality rate between infants and under five is best indicators for improvement the health and nutritional status of Libyan preschool children during the last decades. [12].The higher prevalence of breast feeding among mothers during the last two decades helps to improve the nutrition status of Libyan preschool children [16].

More recently, the higher prevalence of breastfeeding among Libyan mothers decline during the last years due to lack of interest among mothers mainly young mothers and lack of health education from medical and paramedical staff during antenatal care visits in public and private sectors.

Conclusion:

The nutritional status of Libyan preschool children is improved during the last decades, although the stunting, wasting and anemia are still public health problem among Libyan preschool children. Stunting is more among boys than girls and in rural areas than urban areas.

Recommendation:

1-More recent studies on nutritional status of Libyan preschool children.

2-Return the policy of subsidized to the basic food staple in Libya to fight malnutrition problems among Libyan community.

3- Promote ,protect ,and support breastfeeding among Libyan mothers.

4-Foster nutrition education among Libyan society .

5-Nutritional survey is needed in Libya.

6-Available growth charts used in Libya should be revised and develop a national growth charts (local) to follow up the nutritional status of Libyan preschool children.

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